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FEBRUARY 1954

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How I foxed the Navy

by Arthur Godfrey

The Navy almost scuttled me. I shudder to think of it. My crazy career could have ended right there. Who knows, I might still be bumming Chesterfields instead of selling them.

To be scuttled by the Navy you've either got to do something wrong or neglect to do something right. They've got you both ways. For my part, I neglected to finish high school.

Ordinarily, a man can get along without a high school diploma. Plenty of men have. But not in the Navy. At least not in the U. S. Navy Materiel School at Bellevue, D. C., back in 1929. In those days a bluejacket had to have a mind like Einstein's. And I didn't.

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Galaxy

SCIENCE FICTION

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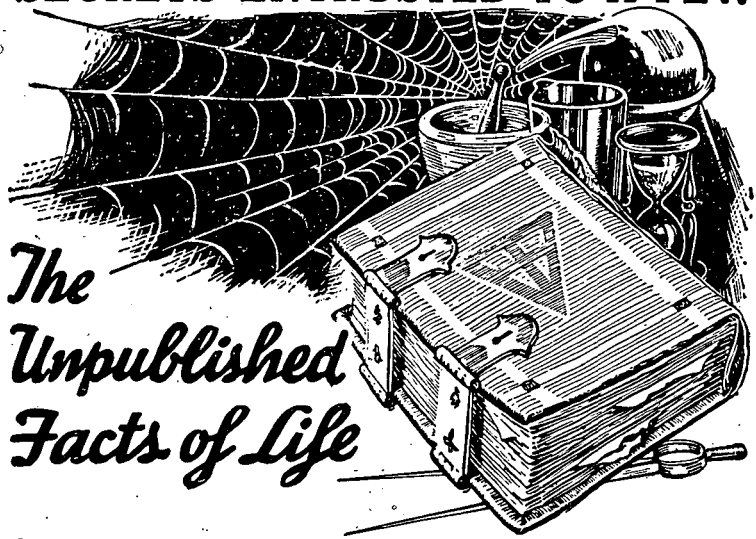

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HELP WANTED!

THE editorial "To the Hills!" in the Oct. 1953 issue seemed alarmingly clear when I wrote it. All of us, I stated, have paper clips, rubber bands, pencils, string, glue, clothes hangers and such — without any of us ever buying them! Yet *somebody* must, otherwise the factories would go out of business.

My conclusion was that by making us dependent on these items, aliens could take over Earth simply by withdrawing them. Armies can't move, governments can't govern, civilians can't escape without pencils for notes, string and glue to make bundles, paper clips to hold documents together and nothing to hang clothes on.

It was beautifully rounded reasoning, all holes plugged, no loose ends left around . . . and a thundering herd of readers kicked the whole structure to pieces.

Capt. K. F. Slater, England: "Ask any woman who sews what happens to the pins she buys. She takes 'em all out, puts them away carefully, but she *always* has to buy more. So it is obvious that your aliens take our pins and give us the other items in exchange."

Lt. Arthur L. Thomas, Travis A.F.B., Cal.: "Millions of people in this country; tens of millions of matches disappearing every day. They'll all reappear at once —*burning*!"

Marion Cox, Sioux City, Iowa: "My rubber bands, paper clips and bobby pins vanish. I can never find a pencil when I want one and I buy them by the dozen. Oh, the humiliation! I'm being *snubbed*—by extraterrestrials yet!"

Anthony Boucher, our cherished rival on *Fantasy & Science Fiction,* argues that he and his equally likable co-editor, J. Francis McComas, can *never* locate any of the items.

Raymond L. Allard, Minneapolis, Minn.: "*I'm* the guy who buys all these things everybody else uses."

Well, that's what every scientist has to face. He builds up a theory that takes in all known data . . . and then discovers he's only half right. Where does the other half fit?

Dean Grennell, Fond du Lac, Wis., thinks his oldest daughter uses his paper clips and rubber bands for shooting at birds. He had to buy string to sell his basement ziggurat of old newspapers—string, 35¢; sale, 30¢; net loss, 5¢. When he finally finds one of his lost ashtrays, it's full

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of hairpins, seashells and crayolas.

Either we're dealing here with clever "people" or they honestly don't see the flaws in their arguments.

Mr. Grennell, as an example, reveals a number of unconsciously telling facts:

He accumulates newspapers. I hadn't thought of that as one of the invasion weapons, but it could be. He has pencils of all sizes, lengths and hardnesses, of which he bought "darn near" every one. *Would a pencil-by-pencil audit prove that claim?* I doubt it. *He periodically has to haul armloads of clothes hangers to a tailor named Joe Rupp* (an alien pun?) and uses a .38 to get rid of his *eternally growing heap of used flashbulbs.*

Mr. Allard confesses to *saving string,* while his wife *hoards tissue and wrapping paper.*

The others admit nothing—a damning omission. Bill Burch, Rockville Centre, N. Y., confirms that uneasy suspicion: "I use great gobs of glue, paper clips and rubber bands and no sooner get in a shipment than they're gone. Now how do I get them back . . . and explain on the profit-and-loss statement? P.S. I don't particularly care to be referred to as an invader after this. P.P.S. Don't worry about the string—I'll explain that when I have more time."

Gobs of paper clips and rubber bands! That may be an important clue. What *kind* of profit-and-loss statement? What does he mean by "after this" and when he has "more time"?

After this disturbing communiqué, the comfort offered by Arthur A. Mennillo, Ft. Walton, Fla., is not enough. He agrees that he has a profusion of the invasion weapons, but assures us that when the factories close, after the alien funds are cut off, there will be enough to last ten years. by then, science will discover substitutes and save the world. (I hope he means better hangers. The present ones fall off at a touch or cling together inextricably.)

A nameless reader says: "The number of those owning the items *exactly* equals those who don't." An alien accountant, eh?

Perhaps H. W. Seyle, Venice, Cal., can be made to talk: "Many years went into development of this foolproof invasion plan. Your perception has earned you an honored place in the coming system."

I'm not bought that easily, "Mr. Seyle"—not, at any rate, by putting me in charge of paper clips!

—H. L. GOLD

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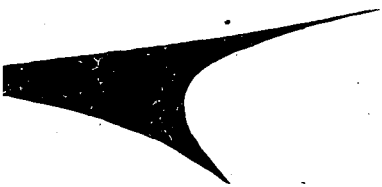
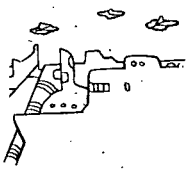


BEEP

By JAMES BLISH



Earth's Secret Service kept peace in the Galaxy efficiently—very efficiently. It was always there . . . before trouble started!

Illustrated by EMSH

I

JOSEF Faber lowered his newspaper slightly. Finding the girl on the park bench looking his way, he smiled the agonizingly embarrassed smile of the thoroughly married nobody caught bird-watching, and ducked back into the paper again.

He was reasonably certain that he looked the part of a middle-aged, steadily employed, harmless citizen enjoying a Sunday break in the bookkeeping and family routines. He was also quite certain, despite his official instructions, that it wouldn't make the slightest bit of difference if he didn't. These boy-meets-girl assignments always came off. Jo had never tackled a single one that had required him.

As a matter of fact, the newspaper, which he was supposed to be using only as a blind, interested him a good deal more than his job did. He had only barely

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begun to suspect the obvious ten years ago when the Service had snapped him up; now, after a decade as an agent, he was still fascinated to see how smoothly the really important situations came off. The *dangerous* situations—not boy-meets-girl.

This affair of the Black Horse Nebula, for instance. Some days ago the papers and the commentators had begun to mention reports of disturbances in that area, and Jo's practiced eye had picked up the mention. Something big was cooking.

Today it had boiled over—the Black Horse Nebula had suddenly spewed ships by the hundreds, a massed armada that must have taken more than a century of effort on the part of a whole star-cluster, a production drive conducted in the strictest and most fanatical kind of secrecy—

And, of course, the Service had been on the spot in plenty of time. With three times as many ships, disposed with mathematical precision so as to enfilade the entire armada the moment it broke from the nebula. The battle had been a massacre, the attack smashed before the average citizen could even begin to figure out what it had been aimed at—and good had triumphed over evil once more.

Of course.

Furtive scuffings on the gravel drew his attention briefly. He looked at his watch, which said 14:58:03. That was the time, according to his instructions, when boy had to meet girl.

He had been given the strictest kind of orders to let nothing interfere with this meeting—the orders always issued on boy-meets-girl assignments. But, as usual, he had nothing to do but observe. The meeting was coming off on the dot, without any prodding from Jo. They always did.

Of course.

WITH a sigh, he folded his newspaper, smiling again at the couple—yes, it was the right man, too—and moved away, as if reluctantly. He wondered what would happen were he to pull away the false mustache, pitch the newspaper on the grass, and bound away with a joyous whoop. He suspected that the course of history would not be deflected by even a second of arc, but he was not minded to try the experiment.

The park was pleasant. The twin suns warmed the path and the greenery without any of the blasting heat which they would bring to bear later in the summer. Randolph was altogether the most comfortable planet he had visited in years. A little backward, perhaps, but restful, too.

It was also slightly over a hundred light-years away from

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Earth. It would be interesting to know how Service headquarters on Earth could have known in advance that boy would meet girl at a certain spot on Randolph, precisely at 14:58:03.

Or how Service headquarters could have ambushed with micrometric precision a major interstellar fleet, with no more preparation than a few days' buildup in the newspapers and video could evidence.

The press was free, on Randolph as everywhere. It reported the news it got. Any emergency concentration of Service ships in the Black Horse area, or anywhere else, would have been noticed and reported on. The Service did not forbid such reports for "security" reasons or for any other reasons. Yet there had been nothing to report but that (a) an armada of staggering size had erupted with no real warning from the Black Horse Nebula, and that (b) the Service had been ready.

By now, it was a commonplace that the Service was always ready. It had not had a defect or a failure in well over two centuries. It had not even had a fiasco, the alarming-sounding technical word by which it referred to the possibility that a boy-meets-girl assignment might not come off.

Jo hailed a hopper. Once inside, he stripped himself of the mustache, the bald spot, the forehead-creases—all the make-up which had given him his mask of friendly innocuousness.

The hoppy watched the whole process in the rear-view mirror. Jo glanced up and met his eyes.

"Pardon me, mister, but I figured you didn't care if I saw you. You must be a Service man."

"That's right. Take me to Service HQ, will you?"

"Sure enough." The hoppy gunned his machine. It rose smoothly to the express level. "First time I ever got close to a Service man. Didn't hardly believe it at first when I saw you taking your face off. You sure looked different."

"Have to, sometimes," Jo said, preoccupied.

"I'll bet. No wonder you know all about everything before it breaks. You must have a thousand faces each, your own mother wouldn't know you, eh? Don't you care if I know about your snooping around in disguise?"

JO grinned. The grin created a tiny pulling sensation across one curve of his cheek, just next to his nose. He stripped away the overlooked bit of tissue and examined it critically.

"Of course not. Disguise is an elementary part of Service work. Anyone could guess that. We

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don't use it often, as a matter of fact—only on very simple assignments."

"Oh." The hoppy sounded slightly disappointed, as melodrama faded. He drove silently for about a minute. Then, speculatively: "Sometimes I think the Service must have time-travel, the things they pull . . . well, here you are. Good luck, mister."

"Thanks."

Jo went directly to Krasna's office. Krasna was a Randolpher, Earth-trained, and answerable to the Earth office, but otherwise pretty much on his own. His heavy, muscular face wore the same expression of serene confidence that was characteristic of Service officials everywhere—even some that, technically speaking, had no faces to wear it.

"Boy meets girl," Jo said briefly. "On the nose and on the spot."

"Good work, Jo. Cigarette?" Krasna pushed the box across his desk.

"Nope, not now. Like to talk to you, if you've got time."

Krasna pushed a button, and a toadstool-like chair rose out of the floor behind Jo. "What's on your mind?"

"Well," Jo said carefully. "I'm wondering why you patted me on the back just now for not doing a job."

"You did a job."

"I did not," Jo said flatly. "Boy would have met girl, whether I'd been here on Randolph or back on Earth. The course of true love always runs smooth. It has in all my boy-meets-girl cases, and it has in the boy-meets-girl cases of every other agent with whom I've compared notes."

"Well, good," Krasna said, smiling. "That's the way we like to have it run. And that's the way we expect it to run. But, Jo, we like to have somebody on the spot, somebody with a reputation for resourcefulness, just in case there's a snag. There almost never is, as you've observed. But—if there were?"

Jo snorted. "If what you're trying to do is to establish preconditions for the future, any interference by a Service agent would throw the eventual result farther *off* the track. I know that much about probability."

"And what makes you think that we're trying to set up the future?"

"It's obvious even to the hoppies on your own planet; the one that brought me here told me he thought the Service had time-travel. It's especially obvious to all the individuals and governments and entire populations that the Service has bailed out of serious messes for centuries, with never a single failure." Jo shrugged. "A man can be asked to safeguard only a small num-

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ber of boy-meets-girl cases before he realizes, as an agent, that what the Service is safeguarding is the future children of those meetings. Ergo—the Service *knows* what those children are to be like, and has reason to want their future existence guaranteed. What other conclusion is possible?"

KRASNA took out a cigarette and lit it deliberately; it was obvious that he was using the maneuver to cloak his response.

"None," he admitted at last. "We have some foreknowledge, of course. We couldn't have made our reputation with espionage alone. But we have obvious other advantages: genetics, for instance, and operations research, the theory of games, the Dirac transmitter—it's quite an arsenal, and of course there's a good deal of prediction involved in all those things."

"I see that," Jo said. He shifted in his chair, formulating all he wanted to say. He changed his mind about the cigarette and helped himself to one. "But these things don't add up to infallibility—and that's a qualitative difference, Kras. Take this affair of the Black Horse armada. The moment the armada appeared, we'll assume, Earth heard about it by Dirac, and started to assemble a counter-armada. But it takes *finite time* to bring together a concentration of ships and men, even if your message system is instantaneous.

"The Service's counter-armada was *already on hand*. It had been building there for so long and with so little fuss that nobody even noticed it concentrating until a day or so before the battle. Then planets in the area began to sit up and take notice, and be uneasy about what was going to break. But not very uneasy; the Service always wins—that's been a statistical fact for centuries. *Centuries*, Kras. Good Lord, it takes almost as long as that, in straight preparation, to pull some of the tricks we've pulled! The Dirac gives us an advantage of ten to twenty-five years in really extreme cases out on the rim of the Galaxy, but no more than that."

He realized that he had been fuming away on the cigarette until the roof of his mouth was scorched, and snubbed it out angrily. "That's a very different thing," he said, "than knowing in a general way how an enemy is likely to behave, or what kind of children the Mendelian laws say a given couple should have. It means that we've some way of reading the future in minute detail. That's in flat contradiction to everything I've been taught about probability, but I have to

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believe what I see."

Krasna laughed. "That's a very able presentation," he said. He seemed genuinely pleased. "I think you'll remember that you were first impressed into the Service when you began to wonder why the news was always good. Fewer and fewer people wonder about that nowadays; it's become a part of their expected environment." He stood up and ran a hand through his hair. "Now you've carried yourself through the next stage. Congratulations, Jo. You've just been promoted!"

"I have?" Jo said incredulously. "I came in here with the notion that I might get myself fired."

"No. Come around to this side of the desk, Jo, and I'll play you a little history." Krasna unfolded the desktop to expose a small visor screen. Obediently Jo rose and went around the desk to where he could see the blank surface. "I had a standard indoctrination tape sent up to me a week ago, in the expectation that you'd be ready to see it. Watch."

Krasna touched the board. A small dot of light appeared in the center of the screen and went out again. At the same time, there was a small *beep* of sound. Then the tape began to unroll and a picture clarified on the screen.

"As you suspected," Krasna said conversationally, "the Service is infallible. How it got that way is a story that started several centuries back. This tape gives all the dope. You should almost be able to imagine what really happened . . ."

II

DANA Lje—her father had been a Hollander, her mother born in the Celebes—sat down in the chair which Captain Robin Weinbaum had indicated, crossed her legs, and waited, her blue-black hair shining under the lights.

Weinbaum eyed her quizzically. The conqueror Resident who had given the girl her entirely European name had been paid in kind, for his daughter's beauty had nothing fair and Dutch about it. To the eye of the beholder, Dana Lje seemed a particularly delicate virgin of Bali, despite her western name, clothing and assurance. The combination had already proven piquant for the millions who watched her television column, and Weinbaum found it no less charming at first hand.

"As one of your most recent victims," he said, "I'm not sure that I'm honored, Miss Lje. A few of my wounds are still bleeding. But I am a good deal puzzled

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as to why you're visiting me now. Aren't you afraid that I'll bite back?"

"I had no intention of attacking you personally, and I don't think I did," the video columnist said seriously. "It was just pretty plain that our intelligence had slipped badly in the Erskine affair. It was my job to say so. Obviously you were going to get hurt, since you're head of the bureau—but there was no malice in it."

"Cold comfort," Weinbaum said dryly. "But thank you, nevertheless."

The Eurasian girl shrugged. "That isn't what I came here about, anyway. Tell me, Captain Weinbaum—have you ever heard of an outfit calling itself Interstellar Information?"

WEINBAUM shook his head. "Sounds like a skip-tracing firm. Not an easy business, these days."

"That's just what I thought when I first saw their letterhead," Dana said. "But the letter under it wasn't one that a private-eye outfit would write. Let me read part of it to you."

Her slim fingers burrowed in her inside jacket pocket, and emerged again with a single sheet of paper. It was plain typewriter bond, Weinbaum noted automatically: she had brought only a copy with her, and had left the original of the letter at home. The copy, then, would be incomplete—probably seriously.

"'It goes like this: 'Dear Miss Lje: As a syndicated video commentator with a wide audience and heavy responsibilities, you need the best sources of information available. We would like you to test our service, free of charge, in the hope of proving to you that it is superior to any other source of news on Earth. Therefore, we offer below several predictions concerning events to come in the Hercules and the so-called "Three Ghosts" areas. If these predictions are fulfilled 100%—no less—we ask that you take us on as your correspondents for those areas, at rates to be agreed upon later. If the predictions are wrong in *any* respect, you need not consider us further.'"

"H'm," Weinbaum said slowly. "They're confident cusses — and that's an odd juxtaposition. The Three Ghosts make up only a little solar system, while the Hercules area could include the entire star-cluster — or maybe even the whole constellation, which is a hell of a lot of sky. This outfit seems to be trying to tell you that it has thousands of field correspondents of its own, maybe as many as the government itself. If so, I'll guarantee

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that they're bragging."

"That may well be so. But before you make up your mind, let me read you one of the two predictions." The letter rustled in Dana Lje's hand. "'At 03:16:10, on Year Day, 2090, the Hess-type interstellar liner *Brindisi* will be attacked in the neighborhood of the Three Ghosts system by four—'"

Weinbaum sat bolt upright in his swivel chair. "Let me see that letter!" he said, his voice harsh with repressed alarm.

"In a moment," the girl said, adjusting her skirt composedly. "Evidently I was right in riding my hunch. Let me go on reading: '—by four heavily armed vessels flying the lights of the navy of Hammersmith II. The position of the liner at that time will be at coded coordinates 88-A-theta-88-aleph-D and-per-se-and. It will—'"

"Miss Lje," Weinbaum said, "I'm sorry to interrupt you again, but what you've said already would justify me in jailing you at once, no matter how loudly your sponsors might scream. I don't know about this Interstellar Information outfit, or whether or not you did receive any such letter as the one you pretend to be quoting. But I can tell you that you've shown yourself to be in possession of information that only yours truly and four other men are supposed to know. It's already too late to tell you that everything you say may be held against you; all I can say now is, it's high time you clammed up!"

"I THOUGHT so," she said, apparently not disturbed in the least. "Then that liner *is* scheduled to hit those coordinates, and the coded time coordinate corresponds with the predicted Universal Time. Is it also true that the *Brindisi* will be carrying a top-secret communications device?"

"Are you deliberately trying to make me imprison you?" Weinbaum said, gritting his teeth. "Or is this just a stunt, designed to show me that my own bureau is full of leaks?"

"It could turn into that," Dana admitted. "But it hasn't, yet. Robin, I've been as honest with you as I'm able to be. You've had nothing but square deals from me up to now. I wouldn't yellow-screen you, and you know it. If this unknown outfit has this information, it might easily have gotten it from where it hints that it got it: from the field."

"Impossible."

"Why?"

"Because the information in question hasn't even reached my *own* agents in the field yet—it couldn't possibly have leaked as far as Hammersmith II or any-

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where else, let alone to the Three Ghosts system! Letters have to be carried on ships, you know that. If I were to send orders by ultrawave to my Three Ghosts agent, he'd have to wait three hundred and twenty-four years to get them. By ship, he can get them in a little over two months.

"What, indeed," Weinbaum said grimly. "You'd better tell me who signed this letter of yours."

"The signature is J. Shelby Stevens."

Weinbaum switched on the intercom. "Margaret, look in the business register for an outfit called Interstellar Information

These particular orders have only been under way to him five days. Even if somebody has read them on board the ship that's carrying them, they couldn't possibly be sent on to the Three Ghosts any faster than they're traveling now."

Dana nodded her dark head. "All right. Then what are we left with but a leak in your headquarters here?"

and find out who owns it."

Dana Lje said, "Aren't you interested in the rest of the prediction?"

"You bet I am. Does it tell you the name of this communications device?"

"Yes," Dana said.

"What is it?"

"The Dirac communicator."

Weinbaum groaned and turned on the intercom again. "Mar-

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garet, send in Dr. Wald. Tell him to drop everything and gallop. Any luck with the other thing?"

"Yes, sir," the intercom said. "It's a one-man outfit, wholly owned by a J. Shelby Stevens, in Rico City. It was first registered this year."

"Arrest him, on suspicion of espionage."

THE door swung open and Dr. Wald came in, all six and a half feet of him. He was extremely blond, and looked awkward, gentle, and not very intelligent.

"Thor, this young lady is our press nemesis, Dana Lje. Dana, Dr. Wald is the inventor of the Dirac communicator, about which you have so damnably much information."

"It's out *already*?" Dr. Wald said, scanning the girl with grave deliberation.

"It is, and lots more—*lots* more. Dana, you're a good girl at heart, and for some reason I trust you, stupid though it is to trust anybody in this job. I should detain you until Year Day, videocasts or no videocasts. Instead, I'm just going to ask you to sit on what you've got, and I'm going to explain why."

"Shoot."

"I've already mentioned how slow communication is between star and star. We have to carry all our letters on ships, just as we did locally before the invention of the telegraph. The overdrive lets us beat the speed of light, but not by much of a margin over really long distances. Do you understand that?"

"Certainly," Dana said. She appeared a bit nettled, and Weinbaum decided to give her the full dose at a more rapid pace. After all, she could be assumed to be better informed than the average layman.

"What we've needed for a long time, then," he said, "is some virtually instantaneous method of getting a message from somewhere to anywhere. Any time lag, *no matter how small it seems at* first, has a way of becoming major as longer and longer distances are involved. Sooner or later we must have this instantaneous method, or we won't be able to get messages from one system to another fast enough to hold our jurisdiction over outlying regions of space."

"Wait a minute," Dana said. "I'd always understood that ultrawave is faster than light."

"Effectively it is; physically it isn't. You don't understand that?"

She shook her dark head.

"In a nutshell," Weinbaum said, "ultrawave is radiation, and all radiation in free space is limited to the speed of light. The way we hype up ultrawave is to

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use an old application of waveguide theory, whereby the real transmission of energy is at light speed, but an imaginary thing called phase velocity is going faster. But the gain in speed of transmission isn't large—by ultrawave, for instance, we get a message to Alpha Centauri in one year instead of nearly four. Over long distances, that's not nearly enough extra speed."

"Can't it be speeded further?" she said, frowning.

"NO Think of the ultrawave beam between here and Centaurus III as a caterpillar. The caterpillar himself is moving quite slowly, just at the speed of light. But the pulses which pass along his body are going forward faster than he is—and if you've ever watched a caterpillar, you'll know that that's true. But there's a physical limit to the number of pulses you can travel along that caterpillar, and we've already reached that limit. We've taken phase velocity as far as it will go.

"That's why we need something faster. For a long time our relativity theories discouraged hope of anything faster—even the high phase velocity of a guided wave didn't contradict those theories; it just found a limited, mathematically imaginary loophole in them. But when Thor here began looking into the question of the velocity of propagation of a Dirac pulse, he found the answer. The communicator he developed does seem to act over long distances, *any* distance, instantaneously—and it may wind up knocking relativity into a cocked hat."

The girl's face was a study in stunned realization. "I'm not sure I've taken in all the technical angles," she said. "But if I'd had any notion of the political dynamite in this thing—"

"—you'd have kept out of my office," Weinbaum said grimly. "A good thing you didn't. The *Brindisi* is carrying a model of the Dirac communicator out to the periphery for a final test; the ship is supposed to get in touch with me from out there at a given Earth time, which we've calculated very elaborately to account for the residual Lorentz and Milne transformations involved in overdrive flight, and for a lot of other time-phenomena that wouldn't mean anything at all to you.

"If that signal arrives here at the given Earth time, then—aside from the havoc it will create among the theoretical physicists whom we decide to let in on it—we will really have our instant communicator, and can include all of occupied space in the same time-zone. And we'll have a terrific advantage over any law-

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breaker who has to resort to ultrawave locally and to letters carried by ships over the long haul."

"Not," Dr. Wald said sourly, "if it's already leaked out."

"It remains to be seen how much of it has leaked," Weinbaum said. "The principle is rather esoteric, Thor, and the name of the thing alone wouldn't mean much even to a trained scientist. I gather that Dana's mysterious informant didn't go into technical details . . . or did he?"

"No," Dana said.

"Tell the truth, Dana. I know that you're suppressing some of that letter."

The girl started slightly. "All right—yes, I am. But nothing technical. There's another part of the prediction that lists the number and class of ships you will send to protect the *Brindisi*—the prediction says they'll be sufficient, by the way—and I'm keeping that to myself, to see whether or not it comes true along with the rest. If it does, I think I've hired myself a correspondent."

"If it does," Weinbaum said, "you've hired yourself a jailbird. Let's see how much mind-reading J. Whatsit Stevens can do from the sub-cellar of Fort Yaphank." He abruptly ended the conversation and ushered Dana Lje out with controlled politeness.

II

WEINBAUM let himself into Stevens' cell, locking the door behind him and passing the keys out to the guard. He sat down heavily on the nearest stool.

Stevens smiled the weak benevolent smile of the very old, and laid his book aside on the bunk. The book, Weinbaum knew—since his office had cleared it—was only a volume of pleasant, harmless lyrics by a New Dynasty poet named Nims.

"Were our predictions correct, Captain?" Stevens said. His voice was high and musical, rather like that of a boy soprano.

Weinbaum nodded. "You still won't tell us how you did it?"

"But I already have," Stevens protested. "Our intelligence network is the best in the Universe, Captain. It is superior even to your own excellent organization, as events have shown."

"Its results are superior, that I'll grant," Weinbaum said glumly. "If Dana Lje had thrown your letter down her disposal chute, we would have lost the *Brindisi* and our Dirac transmitter both. Incidentally, did your original letter predict accurately the number of ships we would send?"

Stevens nodded pleasantly, his neatly trimmed white beard thrusting forward slightly as he smiled.

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"I was afraid so." Weinbaum leaned forward. "Do you have the Dirac transmitter, Stevens?"

"Of course, Captain. How else could my correspondents report to me with the efficiency you have observed?"

"Then why don't our receivers pick up the broadcasts of your agents? Dr. Wald says it's inherent in the principle that Dirac 'casts are picked up by *all* instruments tuned to receive them, bar none. And at this stage of the game, there are so few such broadcasts being made that we'd be almost certain to detect any that weren't coming from our own operatives."

"I decline to answer that question, if you'll excuse the impoliteness," Stevens said, his voice quavering slightly. "I am an old man, Captain, and this intelligence agency is my sole source of income. If I told you how we operated, we would no longer have any advantage over your own service, except for the limited freedom from secrecy which we have. I have been assured by competent lawyers that I have every right to operate a private investigation bureau, properly licensed, upon any scale that I may choose; and that I have the right to keep my methods secret, as the so-called 'intellectual assets' of my firm. If you wish to use our services, well and good. We will provide them, with absolute guarantees on all information we furnish you, for an appropriate fee. But our methods are our own property."

ROBIN WEINBAUM smiled twistedly. "I'm not a naive man, Mr. Stevens," he said. "My service is hard on naivete. You know as well as I do that the government can't allow you to operate on a free-lance basis, supplying top-secret information to anyone who can pay the price, or even free of charge to video columnists on a 'test' basis, even though you arrive at every jot of that information independently of espionage—which I still haven't entirely ruled out, by the way. If you can duplicate this *Brindisi* performance at will, we will have to have your services exclusively. In short, you become a hired civilian arm of my own bureau."

"Quite," Stevens said, returning the smile in a fatherly way. "We anticipated that, of course. However, we have contracts with other governments to consider: Erskine, in particular. If we are to work exclusively for Earth, necessarily our price will include compensation for renouncing our other accounts."

"Why should it? Patriotic public servants work for their government at a loss, if they can't

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work for it any other way."

"I am quite aware of that. I am quite prepared to renounce my other interests. But I do require to be paid."

"How much?" Weinbaum said, suddenly aware that his fists were clenched so tightly that they hurt.

Stevens appeared to consider, nodding his flowery white poll in senile deliberation. "My associates would have to be consulted. Tentatively, however, a sum equal to the present appropriation of your bureau would do, pending further negotiations."

Weinbaum shot to his feet, eyes wide. "You old buccaneer! You know damned well that I can't spend my entire appropriation on a single civilian service! Did it ever occur to you that most of the civilian outfits working for us are on cost-plus contracts, and that our civilian executives are being paid just a credit a year, by their own choice? You're demanding nearly two thousand credits an hour from your own government, and claiming the legal protection that the government affords you at the same time, in order to let those fanatics on Erskine run up a higher bid!"

"The price is not unreasonable," Stevens said. "The service is worth the price."

"That's where you're wrong! We have the discoverer of the machine working for us. For less than half the sum you're asking, we can find the application of the device that you're trading on—of that you can be damned sure."

"A dangerous gamble, Captain."

"PERHAPS. We'll soon see!" Weinbaum glared at the placid face. "I'm forced to tell you that you're a free man, Mr. Stevens. We've been unable to show that you came by your information by any illegal method. You had classified facts in your possession, but no classified documents, and it's your privilege as a citizen to make guesses, no matter how educated.

"But we'll catch up with you sooner or later. Had you been reasonable, you might have found yourself in a very good position with us, your income as assured as any political income can be, and your person respected to the hilt. Now, however, you're subject to censorship—you have no idea how humiliating that can be, but I'm going to see to it that you find out. There'll be no more newsbeats for Dana Lje, or for anyone else. I want to see every word of copy that you file with any client outside the bureau. Every word that is of use to me will be used, and you'll be paid the statutory one cent a word for it—the same rate that the

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FBI pays for anonymous gossip. Everything I don't find useful will be killed without clearance. Eventually we'll have the modification of the Dirac that you're using, and when that happens, you'll be so flat broke that a pancake with a hare lip could spit right over you."

Weinbaum paused for a moment, astonished at his own fury.

Stevens' clarinetlike voice began to sound in the windowless cavity. "Captain, I have no doubt that you can do this to me, at least incompletely. But it will prove fruitless. I will give you a prediction, at no charge. It is guaranteed, as are all our predictions. It is this: *You will never find that modification.* Eventually, I will give it to you, on my own terms, but you will never find it for yourself, nor will you force it out of me. In the meantime, not a word of copy will be filed with you; for, despite the fact that you are an arm of the government, I can well afford to wait you out."

"Bluster," Weinbaum said.

"Fact. Yours is the bluster—loud talk based on nothing more than a hope. I, however, *know* whereof I speak . . . But let us conclude this discussion. It serves no purpose; you will need to see my points made the hard way. Thank you for giving me my freedom. We will talk again under different circumstances on—let me see; ah, yes, on June 9th of the year 2091. That year is, I believe, almost upon us."

Stevens picked up his book again, nodding at Weinbaum, his expression harmless and kindly, his hands showing the marked tremor of *paralysis agitans.* Weinbaum moved helplessly to the door and flagged the turnkey. As the bars closed behind him, Stevens' voice called out: "Oh, yes; and a Happy New Year, Captain."

WEINBAUM blasted his way back into his own office, at least twice as mad as the proverbial nest of hornets, and at the same time rather dismally aware of his own probable future. If Stevens' second prediction turned out to be as phenomenonally accurate as his first had been, Capt. Robin Weinbaum would soon be peddling a natty set of second-hand uniforms.

He glared down at Margaret Soames, his receptionist. She glared right back; she had known him too long to be intimidated.

"Anything?" he said.

"Dr. Wald's waiting for you in your office. There are some field reports, and a couple of Diracs on your private tape. Any luck with the old codger?"

"That," he said crushingly, "is Top Secret."

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"Poof. That means that nobody still knows the answer but J. Shelby Stevens."

He collapsed suddenly. "You're so right. That's just what it does mean. But we'll bust him wide open sooner or later. We've *got* to."

"You'll do it," Margaret said. "Anything else for me?"

"No. Tip off the clerical staff that there's a half-holiday today, then go take in a stereo or a steak or something yourself. Dr. Wald and I have a few private wires to pull . . . and unless I'm sadly mistaken, a private bottle of aquavit to empty."

"Right," the receptionist said. "Tie one on for me, Chief. I understand that beer is the best chaser for aquavit — I'll have some sent up."

"If you should return after I am suitably squiffed," Weinbaum said, feeling a little better already, "I will kiss you for your thoughtfulness. *That* should keep you at your stereo at least twice through the third feature."

As he went on through the door of his own office, she said demurely behind him, "It certainly should."

As soon as the door closed, however, his mood became abruptly almost as black as before. Despite his comparative youth—he was now only fifty-five—he had been in the service a long time, and he needed no one to tell him the possible consequences which might flow from possession by a private citizen of the Dirac communicator. If there was ever to be a Federation of Man in the Galaxy, it was within the power of J. Shelby Stevens to ruin it before it had fairly gotten started. And there seemed to be nothing at all that could be done about it.

"Hello, Thor," he said glumly. "Pass the bottle."

"Hello, Robin. I gather things went badly. Tell me about it."

BRIEFLY, Weinbaum told him. "And the worst of it," he finished, "is that Stevens himself predicts that we won't find the application of the Dirac that he's using, and that eventually we'll have to buy it at his price. Somehow I believe him—but I can't see how it's possible. If I were to tell Congress that I was going to spend my entire appropriation for a single civilian service, I'd be out on my ear within the next three sessions."

"Perhaps that isn't his real price," the scientist suggested. "If he wants to barter, he'd naturally begin with a demand miles above what he actually wants."

"Sure, sure . . . but frankly, Thor, I'd hate to give the old reprobate even a single credit if I could get out of it." Wein-

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baum sighed. "Well, let's see what's come in from the field."

Thor Wald moved silently away from Weinbaum's desk while the officer unfolded it and set up the Dirac screen. Stacked neatly next to the ultraphone—a device Weinbaum had been thinking of, only a few days ago, as permanently outmoded—were the tapes Margaret had mentioned. He fed the first one into the Dirac and turned the main toggle to the position labeled *Start*.

Immediately the whole screen went pure white and the audio speakers emitted an almost instantly end-stopped blare of sound—a *beep* which, as Weinbaum already knew, made up a continuous spectrum from about 30 cycles per second to well above 18,000 cps. Then both the light and the noise were gone as if they had never been, and were replaced by the familiar face and voice of Weinbaum's local ops chief in Rio City.

"There's nothing unusual in the way of transmitters in Stevens' officers here," the operative said without preamble. "And there isn't any local Interstellar Information staff, except for one stenographer, and she's as dumb as they come. About all we could get from her is that Stevens is 'such a sweet old man.' No possibility that she's faking it; she's genuinely stupid, the kind that thinks Betelgevse is something Indians use to darken their skins. We looked for some sort of list or code table that would give us a line on Stevens' field staff, but that was another dead end. Now we're maintaining a 24-hour Dinwiddie watch on the place from a joint across the street. Orders?"

Weinbaum dictated to the blank stretch of tape which followed: "Margaret, next time you send any Dirac tapes in here, cut that damnable *beep* off them first. Tell the boys in Rico City that Stevens has been released, and that I'm proceeding for an Order In Security to tap his ultraphone and his local lines—this is one case where I'm sure we can persuade the court that tapping's necessary. Also—and be damned sure you code this—tell them to proceed with the tap immediately and to maintain it regardless of whether or not the court okays it. I'll thumbprint a Full Responsibility Confession for them. We can't afford to play patty-cake with Stevens—the potential is just too damned big. And oh, yes, Margaret, send the message by carrier, and send out general orders to everybody concerned not to use the Dirac again except when distance and time rule every other medium out. Stevens has already admitted that he can receive Dirac 'casts."

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HE put down the mike and stared morosely for a moment at the beautiful Eridanean scrollwood of his desktop. Wald coughed inquiringly and retrieved the aquavit.

"Excuse me, Robin," he said, "but I should think that would work both ways."

"So should I. And yet the fact is that we've never picked up so much as a whisper from either Stevens or his agents. I can't think of any way that could be pulled, but evidently it can."

"Well, let's rethink the problem, and see what we get," Wald said. "I didn't want to say so in front of the young lady, for obvious reasons—I mean Miss Lje, of course, not Margaret—but the truth is that the Dirac is essentially a simple mechanism in principle. I seriously doubt that there's any way to transmit a message from it which can't be detected—and an examination of the theory with that proviso in mind might give us something new."

"What proviso?" Weinbaum said. Thor Wald left him behind rather often these days.

"Why, that a Dirac transmission doesn't *necessarily* go to all communicators capable of receiving it. If that's true, then the reasons why it is true should emerge from the theory."

"I see. Okay, proceed on that line. I've been looking at Stevens' dossier while you were talking, and it's an absolute desert. Prior to the opening of the office in Rico City, there's no dope whatever on J. Shelby Stevens. The man as good as rubbed my nose in the fact that he's using a pseud when I first talked to him. I asked him what the 'J' in his name stood for, and he said, 'Oh, let's make it Jerome.' But who the man behind the pseud *is*—"

"Is it possible that he's using his own initials?"

"No," Weinbaum said. "Only the dumbest ever do that, or transpose syllables, or retain any connection at all with their real names. Those are the people who are in serious emotional trouble, people who drive themselves into anonymity, but leave clues strewn all around the landscape—those clues are really a cry for help, for discovery. Of course we're working on that angle—we can't neglect anything—but J. Shelby Stevens isn't that kind of case, I'm sure." Weinbaum stood up abruptly. "Okay, Thor—what's first on your technical program?"

"Well . . . I suppose we'll have to start with checking the frequencies we use. We're going on Dirac's assumption—and it works very well, and always has—that a positron in motion through a crystal lattice is accompanied by

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de Broglie waves which are transforms of the waves of an electron in motion somewhere else in the Universe. Thus if we control the frequency and path of the positron, we control the placement of the electron—we cause it to appear, so to speak, in the circuits of a communicator somewhere else. After that, reception is just a matter of amplifying the bursts and reading the signal."

WALD scowled and shook his blond head. "If Stevens is getting out messages which we don't pick up, my first assumption would be that he's worked out a fine-tuning circuit that's more delicate than ours, and is more or less sneaking his messages under ours. The only way that could be done, as far as I can see at the moment, is by something really fantastic in the way of exact frequency control of his positron-gun. If so, the logical step for us is to go back to the beginning of our tests and re-run our diffractions to see if we can refine our measurements of positron frequencies."

The scientist looked so inexpressibly gloomy as he offered this conclusion that a pall of hopelessness settled over Weinbaum in sheer sympathy. "You don't look as if you expected that to uncover anything new."

"I don't. You see, Robin, things are different in physics now than they used to be in the Twentieth Century. In those days, it was always presupposed that physics was limitless—the classic statement was made by Weyl, who said that 'It is the nature of a real thing to be inexhaustible in content.' We know now that that's not so, except in a remote, associational sort of way. Nowadays, physics is a defined and self-limited science; its scope is still prodigious, but we can no longer think of it as endless.

"This is better established in particle physics than in any other branch of the science. Half of the trouble physicists of the last century had with Euclidean geometry—and hence the reason why they evolved so many recomplicated theories of relativity—is that it's a geometry of lines, and thus can be subdivided infinitely. When Cantor proved that there really is an infinity, at least mathematically speaking, that seemed to clinch the case for the possibility of a really infinite physical universe, too."

Wald's eyes grew vague, and he paused to gulp down a slug of the licorice-flavored aquavit which would have made Weinbaum's every hair stand on end.

"I remember," Wald said, "the man who taught me theory of sets at Princeton, many years

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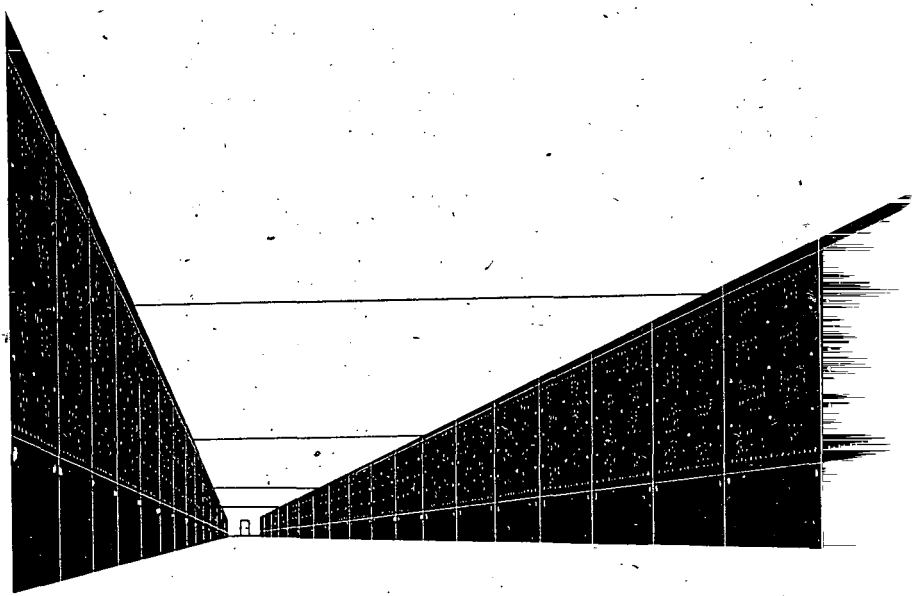
ago. He used to say: 'Cantor teaches us that there are many kinds of infinities.' *There* was a crazy old man!"

Weinbaum rescued the bottle hastily. "So go on, Thor."

"Oh." Wald blinked. "Yes. Well, what we know now is that the geometry which applies to ultimate particles, like the positron, isn't Euclidean at all. It's Pythagorean — a geometry of points, not lines. Once you've measured one of those points, and it doesn't matter what kind of quantity you're measuring, you're down as far as you can go. At that point, the Universe becomes discontinuous, and no further refinement is possible.

"And I'd say that our positron-frequency measurements have already gotten that far down. There isn't another element in the Universe denser than plutonium, yet we get the same frequency-values by diffraction through plutonium crystals that we get through osmium crystals—there's not the slightest difference. If J. Shelby Stevens is operating in terms of fractions of those values, then he's doing what an organist would call 'playing in the cracks' —which is certainly something you can *think* about doing, but



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something that's in actuality impossible to do. *Hoop.*"

"Hoop?" Weinbaum said.

"Sorry. A hiccup only."

"Oh. Well, maybe Stevens has rebuilt the organ?"

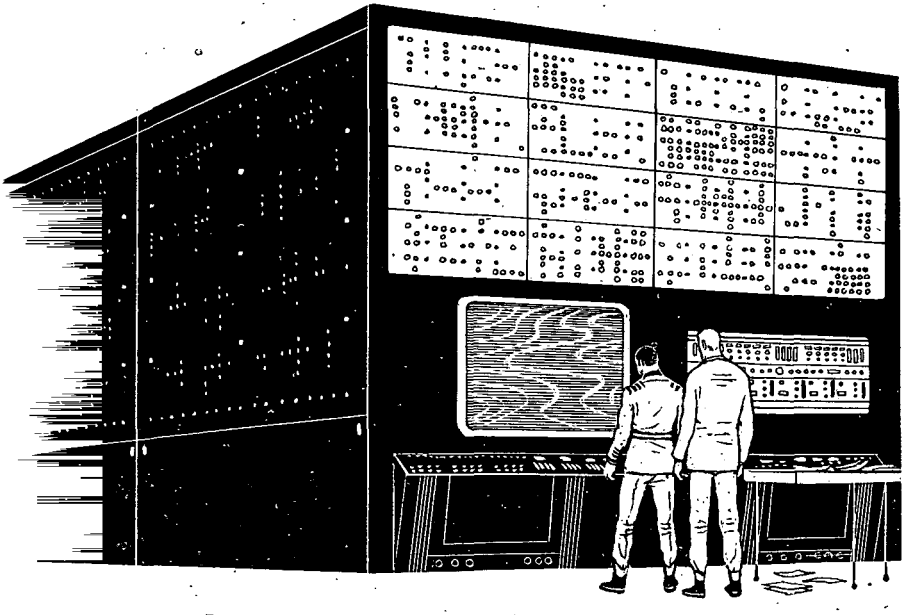
"If he has rebuilt the metrical frame of the Universe to accommodate a private skip-tracing firm," Wald said firmly, "I for one see no reason why we can't counter-check him — *hoop* — by declaring the whole cosmos null and void."

"All right, all right," Weinbaum said, grinning. "I didn't mean to push your analogy right over the edge—I was just asking. But let's get to work on it anyhow. We can't just sit here and let Stevens get away with it. If this frequency angle turns out to be as hopeless as it seems, we'll try something else."

Wald eyed the aquavit bottle owlishly. "It's a very pretty problem," he said. "Have I ever sung you the song we have in Sweden called 'Nat-og-Dag?' "

"*Hoop,*" Weinbaum said, to his own surprise, in a high falsetto. "Excuse me. No. Let's hear it."

THE computer occupied an entire floor of the Security building, its seemingly identical banks



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laid out side by side on the floor along an advanced pathological state of Peano's "space-filling curve." At the current business end of the line was a master control board with a large television screen at its center, at which Dr. Wald was stationed, with Weinbaum looking, silently but anxiously, over his shoulder.

The screen itself showed a pattern which, except that it was drawn in green light against a dark gray background, strongly resembled the grain in a piece of highly polished mahogany. Photographs of similar patterns were stacked on a small table to Dr. Wald's right; several had spilled over onto the floor.

"Well, there it is," Wald sighed at length. "And I won't struggle to keep myself from saying 'I told you so.' What you've had me do here, Robin, is to reconfirm about half the basic postulates of particle physics—which is why it took so long, even though it was the first project we started." He snapped off the screen. "There are no cracks for J. Shelby to play in. That's definite."

"If you'd said 'That's flat,' you would have made a joke," Weinbaum said sourly. "Look . . . isn't there still a chance of error? If not on your part, Thor, then in the computer? After all, it's set up to work only with the unit charges of modern physics; mightn't we have to disconnect the banks that contain that bias before the machine will follow the fractional-charge instructions we give it?"

"Disconnect, he says," Wald groaned, mopping his brow reflectively. "The bias exists everywhere in the machine, my friend, because it functions everywhere on those same unit charges. It wasn't a matter of subtracting banks; we had to add one with a bias all its own, to counter-correct the corrections the computer would otherwise apply to the instructions. The technicians thought I was crazy. Now, five months later, I've proved it."

Weinbaum grinned in spite of himself. "What about the other projects?"

"All done—some time back, as a matter of fact. The staff and I checked every single Dirac tape we've received since you released J. Shelby from Yaphank, for any sign of intermodulation, marginal signals, or anything else of the kind. There's nothing, Robin, absolutely nothing. That's our net result, all around."

"Which leaves us just where we started," Weinbaum said. "All the monitoring projects came to the same dead end; I strongly suspect that Stevens hasn't risked any further calls from his home office to his field staff, even

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though he seemed confident that we'd never intercept such calls—as we haven't. Even our local wiretapping hasn't turned up anything but calls by Stevens' secretary, making appointments for him with various clients, actual and potential. Any information he's selling these days he's passing on in person—and not in his office, either, because we've got bugs planted all over that and haven't heard a thing."

"That must limit his range of operation enormously," Wald objected.

WEINBAUM nodded. "Without a doubt—but he shows no signs of being bothered by it. He can't have sent any tips to Erskine recently, for instance, because our last tangle with that crew came out very well for us, even though we had to use the Dirac to send the orders to our squadron out there. If he overheard us, he didn't even try to pass the word. Just as he said, he's sweating us out—" Weinbaum paused. "Wait a minute, here comes Margaret. And by the length of her stride, I'd say she's got something particularly nasty on her mind."

"You bet I do," Margaret Soames said vindictively. "And it'll blow plenty of lids around here, or I miss my guess. The I.D. squad has finally pinned down J. Shelby Stevens. They did it with the voice-comparator alone."

"How does that work?" Wald said interestedly.

"Blink microphone," Weinbaum said impatiently. "Isolates inflections on single, normally stressed syllables and matches them. Standard I.D. searching technique, on a case of this kind, but it takes so long that we usually get the quarry by other means before it pays off. Well, don't stand there like a dummy, Margaret. Who is he?"

"'He,'" Margaret said, "is your sweetheart of the video waves, Miss Dana Lje."

"They're crazy!" Wald said, staring at her.

Weinbaum came slowly out of his first shock of stunned disbelief. "No, Thor," he said finally. "No, it figures. If a woman is going to go in for disguises, there are always two she can assume outside her own sex: a young boy, and a very old man. And Dana's an actress; that's no news to us."

"But—but why did she do it, Robin?"

"That's what we're going to find out right now. So we wouldn't get the Dirac modification by ourselves, eh! Well, there are other ways of getting answers besides particle physics. Margaret, do you have a pick-up

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order out for that girl?"

"No," the receptionist said. "This is one chestnut I wanted to see you pull out for yourself. You give me the authority, and I send the order—not before."

"Spiteful child. Send it, then, and glory in my gritted teeth. Come on, Thor—let's put the nutcracker on this chestnut."

As they were leaving the computer floor, Weinbaum stopped suddenly in his tracks and began to mutter in an almost inaudible voice.

Wald said, "What's the matter, Robin?"

"Nothing. I keep being brought up short by those predictions. What's the date?"

"M'm . . . June 9th. Why?"

"It's the exact date that 'Stevens' predicted we'd meet again, damn it! Something tells me that this isn't going to be as simple as it looks."

IF Dana Lje had any idea of what she was in for—and considering the fact that she was 'J. Shelby Stevens' it had to be assumed that she did—the knowledge seemed not to make her at all fearful. She sat as composedly as ever before Weinbaum's desk, smoking her eternal cigarette, and waited, one dimpled knee pointed directly at the bridge of the officer's nose.

"Dana," Weinbaum said, "this time we're going to get all the answers, and we're not going to be gentle about it. Just in case you're not aware of the fact, there are certain laws relating to giving false information to a security officer, under which we could heave you in prison for a minimum of fifteen years. By application of the statutes on using communications to defraud, plus various local laws against transvestism, pseudonymity and so on, we could probably pile up enough additional short sentences to keep you in Yaphank until you really *do* grow a beard. So I'd advise you to open up."

"I have every intention of opening up," Dana said. "I know, practically word for word, how this interview is going to proceed, what information I'm going to give you, just when I'm going to give it to you—and what you're going to pay me for it. I knew all that many months ago. So there would be no point in my holding out on you."

"What you're saying, Miss Lje," Thor Wald said in a resigned voice, "is that the future is fixed, and that you can read it, in every essential detail."

"Quite right, Dr. Wald. Both those things are true."

There was a brief silence.

"All right," Weinbaum said grimly. "Talk."

"All right, Captain Weinbaum,

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pay me," Dana said calmly.

Weinbaum snorted.

"But I'm quite serious," she said. "You still don't know what I know about the Dirac communicator. I won't be forced to tell it, by threat of prison or by any other threat. You see, I know for a fact that you aren't going to send me to prison, or give me drugs, or do anything else of that kind. I know for a fact, instead, that you are going to pay me—so I'd be very foolish to say a word until you do. After all, it's quite a secret you're buying. Once I tell you what it is, you and the entire service will be able to read the future as I do, and then the information will be valueless to me."

Weinbaum was completely speechless for a moment. Finally he said, "Dana, you have a heart of purest brass, as well as a knee with an invisible gunsight on it. I say that I'm *not* going to give you my appropriation, regardless of what the future may or may not say about it. I'm not going to give it to you because the way my Government — and yours — runs things makes such a price impossible. Or is that really your price?"

"It's my real price . . . but it's also an alternative. Call it my second choice. My first choice, which means the price I'd settle for, comes in two parts: (a), to be taken into your service as a responsible officer; and, (b), to be married to Capt. Robin Weinbaum."

WEINBAUM sailed up out of his chair. He felt as though copper-colored flames a foot long were shooting out of each of his ears.

"Of all the—" he began. There his voice failed completely.

From behind him, where Wald was standing, came something like a large, Scandanavian-model guffaw being choked into insensibility.

Dana herself seemed to be smiling a little.

"You see," she said, "I don't point my best and most accurate knee at every man I meet."

Weinbaum sat down again, slowly and carefully. "Walk, do not run, to nearest exit," he said. "Women and childlike security officers first. Miss Lje, are you trying to sell me the notion that you went through this elaborate hanky-panky — beard and all — out of a burning passion for my dumpy and underpaid person?"

"Not entirely," Dana Lje said. "I want to be in the bureau, too, as I said. Let me confront you, though, Captain, with a fact of life that doesn't seem to have occurred to you at all. Do you accept as a fact that I can read the future in detail, and that that, to

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be possible at all, means that the future is fixed?".

"Since Thor seems able to accept it, I suppose I can too—provisionally."

"There's nothing provisional about it," Dana said firmly. "Now, when I first came upon this—uh, this gimmick—quite a while back, one of the first things that I found out was that I was going to go through the 'J. Shelby Stevens' masquerade, force myself onto the staff of the bureau, and marry you, Robin. At the time, I was both astonished and completely rebellious. I didn't want to be on the bureau staff; I liked my free-lance life as a video commentator. I didn't want to marry you, though I wouldn't have been averse to living with you for a while—say a month or so. And above all, the masquerade struck me as ridiculous.

"But the facts kept staring me in the face. I *was* going to do all those things. There were no alternatives, no fanciful 'branches of time,' no decision-points that might be altered to make the future change. My future, like yours, Dr. Wald's, and everyone else's, was fixed. It didn't matter a snap whether or not I had a decent motive for what I was going to do; I was going to do it anyhow. Cause and effect, as I could see for myself, just don't exist. One event follows another because events are just as indestructible in space-time as matter and energy are.

"It was the bitterest of all pills. It will take me many years to swallow it completely, and you too. Dr. Wald will come around a little sooner, I think. At any rate, once I was intellectually convinced that all this was so, I had to protect my own sanity. I knew that I couldn't alter what I was going to do, but the least I could do to protect myself was to supply myself with motives. Or, in other words, just plain rationalizations. That much, it seems, we're free to do; the consciousness of the observer is just along for the ride through time, and can't alter events—but it can comment, explain, invent. That's fortunate, for none of us could stand going through motions which were truly free of what we think of as personal significances.

"So I supplied myself with the obvious motives. Since I was going to be married to you and couldn't get out of it, I set out to convince myself that I loved you. Now I do. Since I was going to join the bureau staff, I thought over all the advantages that it might have over video commentating, and found that they made a respectable list. Those are my motives.

"But I had no such motives at

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the beginning. Actually, there are never motives behind actions. All actions are fixed. What we called motives evidently are rationalizations by the helpless observing consciousness, which is intelligent enough to smell an event coming —and, since it cannot avert the event, instead cooks up reasons for wanting it to happen."

"Wow," Dr. Wald said, inelegantly but with considerable force.

"EITHER 'wow' or 'balderdash' seems to be called for —I can't quite decide which," Weinbaum agreed. "We know that Dana is an actress, Thor, so let's not fall off the apple tree quite yet. Dana, I've been saving the *really* hard question for the last. That question is: *How?* How did you arrive at this modification of the Dirac transmitter? Remember, we know your background, where we didn't know that of 'J. Shelby Stevens.' You're not a scientist. There were some fairly high-powered intellects among your distant relatives, but that's as close as you come."

"I'm going to give you several answers to that question," Dana Lje said. "Pick the one you like best. They're all true, but they tend to contradict each other here and there.

"To begin with, you're right about my relatives, of course. If you'll check your dossier again, though, you'll discover that those so-called 'distant' relatives were the last surviving members of my family besides myself. When they died, second and fourth and ninth cousins though they were, their estates reverted to me, and among their effects I found a sketch of a possible instantaneous communicator based on de Broglie-wave inversion. The material was in very rough form, and mostly beyond my comprehension, because I am, as you say, no scientist myself. But I was interested; I could see, dimly, what such a thing might be worth—and not only in money.

"My interest was fanned by two coincidences—the kind of coincidences that cause-and-effect just can't allow, but which seem to happen all the same in the world of unchangeable events. For most of my adult life, I've been in communications industries of one kind or another, mostly branches of video. I had communications equipment around me constantly, and I had coffee and doughnuts with communications engineers every day. First I picked up the jargon; then, some of the procedures; and eventually, a little real knowledge. Some of the things I learned can't be gotten any other way. Some other things are ordinarily

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available only to highly educated people like Dr. Wald here, and came to me by accident, in horseplay, between kisses, and a hundred other ways—all natural to the environment of a video network."

Weinbaum found, to his own astonishment, that the "between kisses" clause did not sit very well in his chest. He said, with unintentional brusqueness: "What's the other coincidence?"

"A leak in your own staff."

"Dana, you ought to have that set to music."

"Suit yourself."

"I can't suit myself," Weinbaum said petulantly. "I work for the Government. Was this leak direct to you?"

"Not at first. That was why I kept insisting to you in person that there might be such a leak, and why I finally began to hint about it in public, on my program. I was hoping that you'd be able to seal it up inside the bureau before my first rather tenuous contact with it got lost. When I didn't succeed in provoking you into protecting yourself, I took the risk of making direct contact with the leak myself—and the first piece of secret information that came to me through it was the final point I needed to put my Dirac communicator together. When it was all assembled, it did more than just communicate. It predicted. And I can tell you why."

WEINBAUM said thoughtfully, "I don't find this very hard to accept, so far. Pruned of the philosophy, it even makes some sense of the 'J. Shelby Stevens' affair. I assume that by letting the old gentleman become known as somebody who knew more about the Dirac transmitter than I did, and who wasn't averse to negotiating with anybody who had money, you kept the leak working through you—rather than transmitting data directly to unfriendly governments."

"It did work out that way," Dana said. "But that wasn't the genesis or the purpose of the Stevens masquerade. I've already given you the whole explanation of how that came about."

"Well, you'd better name me that leak, before the man gets away."

"When the price is paid, not before. It's too late to prevent a getaway, anyhow. In the meantime, Robin, I want to go on and tell you the other answer to your question about how I was able to find this particular Dirac secret, and you didn't. What answers I've given you up to now have been cause-and-effect answers, with which we're all more

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comfortable. But I want to impress on you that all apparent cause-and-effect relationships are accidents. There is no such thing as a cause, and no such thing as an effect. I found the secret because I found it; that event was fixed; that certain circumstances seem to explain why I found it, in the old cause-and-effect terms, is irrelevant. Similarly, with all your superior equipment and brains, you didn't find it for one reason, and one reason alone: because you didn't find it. The history of the future says you didn't."

"I pays my money and I takes no choice, eh?" Weinbaum said ruefully.

"I'm afraid so—and I don't like it any better than you do."

"Thor, what's your opinion of all this?"

"It's just faintly flabbergasting," Wald said soberly. "However, it hangs together. The deterministic Universe which Miss Lje paints was a common feature of the old relativity theories, and as sheer speculation has an even longer history. I would say that in the long run, how much credence we place in the story as a whole will rest upon her method of, as she calls it, reading the future. If it is demonstrable beyond any doubt, then the rest becomes perfectly credible—philosophy and all. If it doesn't, then what remains is an admirable job of acting, plus some metaphysics which, while self-consistent, are not original with Miss Lje."

"That sums up the case as well as if I'd coached you, Dr. Wald," Dana said. "I'd like to point out one more thing. If I can read the future, then 'J. Shelby Stevens' never had any need for a staff of field operatives, and he never needed to send a single Dirac message which you might intercept. All he needed to do was to make predictions from his readings, which he knew to be infallible; no private espionage network had to be involved."

"I see that," Weinbaum said dryly. "All right, Dana, let's put the proposition this way: *I do not believe you.* Much of what you say is probably true, but in totality I believe it to be false. On the other hand, if you're telling the whole truth, you certainly deserve a place on the bureau staff—it would be dangerous as hell *not* to have you with us—and the marriage is a more or less minor matter, except to you and me. You can have that with no strings attached; I don't want to be bought, any more than you would.

"So: if you will tell me where the leak is, we will consider that part of the question closed. I make that condition not as a price, but because I don't want

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to get myself engaged to somebody who might be shot as a spy within a month."

"Fair enough," Dana said. "Robin, your leak is Margaret Soames. She is an Erskine operative, and nobody's bubble-brain. She's a highly trained technician."

"Well, I'll be damned," Weinbaum said in astonishment. "Then she's already flown the coop—she was the one who first told me we'd identified you. She must have taken on that job in order to hold up delivery long enough to stage an exit."

"That's right. But you'll catch her, day after tomorrow. And you are now a hooked fish, Robin."

There was another suppressed burble from Thor Wald.

"I accept the fate happily," Weinbaum said, eying the gun-sight knee. "Now, if you will tell me how you work your swami trick, and if it backs up everything you've said to the letter, as you claim, I'll see to it that you're also taken into the bureau and that all charges against you are quashed. Otherwise, I'll probably have to kiss the bride between the bars of a cell."

Dana smiled. "The secret is very simple. It's in the beep."

WEINBAUM'S jaw dropped. "The beep? The Dirac noise?"

"That's right. You didn't find it out because you considered the beep to be just a nuisance, and ordered Miss Soames to cut it off all tapes before sending them in to you. Miss Soames, who had some inkling of what the beep meant, was more than happy to do so, leaving the reading of the beep exclusively to 'J. Shelby Stevens'—who she thought was going to take on Erskine as a client."

"Explain," Thor Wald said, looking intense.

"Just as you assumed, every Dirac message that is sent is picked up by every receiver that is capable of detecting it. *Every* receiver—including the first one ever built, which is yours, Dr. Wald, through the hundreds of thousands of them which will exist throughout the Galaxy in the Twenty-Fourth Century, to the untold millions which will exist in the Thirtieth Century, and so on. The Dirac beep is the simultaneous reception of *every one of the Dirac messages which have ever been sent, or ever will be sent.* Incidentally, the cardinal number of the total of those messages is a relatively small and of course finite number; it's far below really large finite numbers such as the number of electrons in the Universe, even when you break each and every message down into indivi-

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dual 'bits' and count those."

"Of course," Dr. Wald said softly. "Of course! But, Miss Lje . . . how do you tune for an individual message? We tried fractional positron frequencies, and got nowhere."

"I didn't even know fractional positron frequencies existed," Dana confessed. "No, it's simple—so simple that a lucky layman like me could arrive at it. You tune individual messages out of the beep by time-lag, nothing more. All the messages arrive at the same instant, in the smallest fraction of time that exists, something called a 'chronon.'"

"Yes," Wald said. "The time it takes one electron to move from one quantum-level to another. That's the Pythagorean point of time-measurement."

"Thank you. Obviously no gross physical receiver can respond to a message that brief, or at least that's what I thought at first. But because there are relay and switching delays, various forms of feedback and so on in the apparatus itself, the beep arrives at the output end as a complex pulse which has been 'splattered' along the time axis for a full second or more. That's an effect which you can exaggerate by recording the 'splattered' beep on a high-speed tape, the same way you would record any event that you wanted to study in slow motion. Then you tune up the various failure-points in your receiver, to exaggerate one failure, minimize all the others, and use noise-suppressing techniques to cut out the background."

THOR WALD frowned. "You'd still have a considerable garble when you were through. You'd have to sample the messages—"

"Which is just what I did; Robin's little lecture to me about the ultrawave gave me that hint. I set myself to find out how the ultrawave channel carries so many messages at once, and I discovered that you people sample the incoming pulses every thousandth of a second and pass on one pip only when the wave deviates in a certain way from the mean. I didn't really believe it would work on the Dirac beep, but it turned out just as well: *90%* as intelligible as the original transmission after it came through the smearing device. I'd already got enough from the beep to put my plan in motion, of course—but now every voice message in it was available, and crystal-clear. If you select three pips every thousandth of a second, you can even pick up an intelligible transmission of music—a little razzy, but good enough to identify the instruments that are

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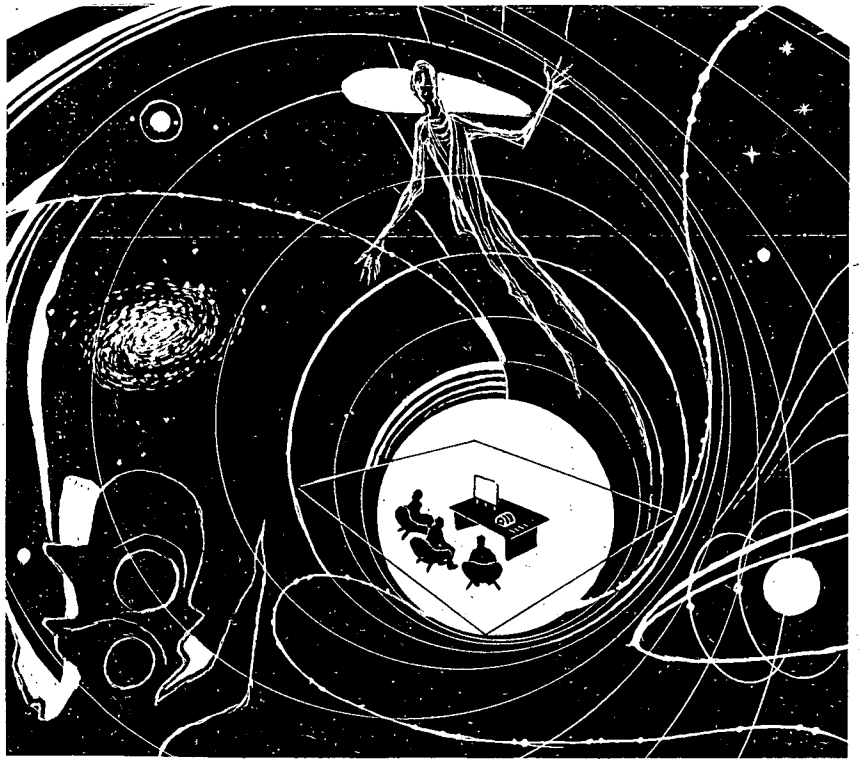
playing—and that's a very close test of any communications device."

"There's a question of detail here that doesn't quite follow," said Weinbaum, for whom the technical talk was becoming a little too thick to fight through. "Dana, you say that you knew the course this conversation was going to take—yet it isn't being Dirac-recorded, nor can I see any reason why any summary of it would be sent out on the Dirac afterwards."

"That's true, Robin. However, when I leave here, I will make such a transcast myself, on my own Dirac. Obviously I will—because I've *already* picked it up, from the beep."

"In other words, you're going to call yourself up—months ago."

"That's it," Dana said. "It's



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not as useful a technique as you might think at first, because it's dangerous to make such broadcasts while a situation is still developing. You can safely 'phone back' details only after the given situation has gone to completion, as a chemist might put it. Once you know, however, that when you use the Dirac you're dealing with time, you can coax some very strange things out of the instrument."

She paused and smiled. "I have heard," she said conversationally, "the voice of the President of our Galaxy, in 3480, announcing the federation of the Milky Way and the Magellanic Clouds. I've heard the commander of a world-line cruiser, traveling from 8873 to 8704 along the world-line of the planet Hathshepa, which circles a star on the rim of NGC 4725, calling for help across eleven million light-years—but what kind of help he was calling for, or will be calling for, is beyond my comprehension. And many other things. When you check on me, you'll hear these things too—and you'll wonder what many of them mean.

"And you'll listen to them even more closely than I did, in the hope of finding out whether or not anyone was able to understand in time to help."

Weinbaum and Wald looked dazed.

HER voice became a little more somber. "Most of the voices in the Dirac beep are like that—they're cries for help, which you can overhear decades or centuries before the senders get into trouble. You'll feel obligated to answer every one, to try to supply the help that's needed. And you'll listen to the succeeding messages and say: 'Did we—will we get there in time? Did we understand in time?'

"And in most cases you won't be sure. You'll know the future, but not what most of it means. The farther into the future you travel with the machine, the more incomprehensible the messages become, and so you're reduced to telling yourself that time will, after all, have to pass by at its own pace, before enough of the surrounding events can emerge to make those remote messages clear.

"The long run effect, as far as I can think it through, is not going to be that of omniscience—of our consciousness being extracted entirely from the time-stream and allowed to view its whole sweep from one side. Instead, the Dirac in effect simply slides the bead of consciousness forward from the present a certain distance. Whether it's five hundred or five thousand years still remains to be seen. At that point the law of diminishing returns sets in—or

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the noise-factor begins to overbalance the information, take your choice—and the observer is reduced to traveling in time at the same old speed. He's just a bit ahead of himself."

"You've thought a great deal about this," Wald said slowly. "I dislike to think of what might have happened had some less conscientious person stumbled on the beep."

"That wasn't in the cards," Dana said.

In the ensuing quiet, Weinbaum felt a faint, irrational sense of let-down, of something which had promised more than had been delivered—rather like the taste of fresh bread as compared to its smell, or the discovery that Thor Wald's Swedish "folk-song" *Nat-og-Dag* was only Cole Porter's *Night and Day* in another language. He recognized the feeling: it was the usual emotion of the hunter when the hunt is over, the born detective's professional version of the *post coitum triste*. After looking at the smiling, supple Dana Lje a moment more, however, he was almost content.

"There's one more thing," he said. "I don't want to be insufferably skeptical about this—but I want to see it work. Thor, can we set up a sampling and smearing device such as Dana describes and run a test?"

"In fifteen minutes," Dr. Wald said. "We have most of the unit in already assembled form on our big ultrawave receiver, and it shouldn't take any effort to add a high-speed tape unit to it. I'll do it right now."

He went out. Weinbaum and Dana looked at each other for a moment, rather like strange cats. Then the security officer got up, with what he knew to be an air of somewhat grim determination, and seized his fiancee's hands, anticipating a struggle.

That first kiss was, by intention at least, mostly *pro forma*. But by the time Wald padded back into the office, the letter had been pretty thoroughly superseded by the spirit.

THE scientist harrumphed and set his burden on the desk. "This is all there is to it," he said, "but I had to hunt all through the library to find a Dirac record with a beep still on it. Just a moment more while I make connections . . ."

Weinbaum used the time to bring his mind back to the matter at hand, although not quite completely. Then two tape spindles began to whir like so many bees, and the end-stopped sound of the Dirac beep filled the room. Wald stopped the apparatus, reset it, and started the smearing tape very slowly in the opposite direction.

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A DISTANT babble of voices came from the speaker. As Weinbaum leaned forward tensely, one voice said clearly and loudly above the rest:

"Hello, Earth bureau. Lt. T. L. Matthews at Hercules Station NGC 6341, transmission date 13-22-2091. We have the last point on the orbit-curve of your dope-runners plotted, and the curve itself points to a small system about 25 light-years from the base here; the place hasn't even got a name on our charts. Scouts show the home planet at least twice as heavily fortified as we anticipated, so we'll need another cruiser. We have a 'can-do' from you in the beep for us, but we're waiting as ordered to get it in the present. NGC 6341 Matthews out."

After the first instant of stunned amazement—for no amount of intellectual willingness to accept could have prepared him for the overwhelming fact itself—Weinbaum had grabbed a pencil and begun to write at top speed. As the voice signed out he threw the pencil down and looked excitedly at Dr. Wald.

"Seven months ahead," he said, aware that he was grinning like an idiot. "Thor, you know the trouble we've had with that needle in the Hercules haystack! This orbit-curve trick must be something Matthews has yet to dream up—at least he hasn't come to me with it yet, and there's nothing in the situation as it stands now that would indicate a closing-time of six months for the case. The computers said it would take three more years."

"It's new data," Dr. Wald agreed solemnly.

"Well, don't stop there, in God's name! Let's hear some more!"

Dr. Wald went through the ritual, much faster this time. The speaker said:

"Nausentampen. Eddettompic. Berobsilom. Aimkaksetchoc. Sanbetogmow. Datdectamset. Domatrosmin. Out."

"My word," Wald said. "What's all that?"

"That's what I was talking about," Dana Lje said. "At least half of what you get from the beep is just as incomprehensible. I suppose it's whatever has happened to the English language, thousands of years from now."

"No, it isn't," Weinbaum said. He had resumed writing, and was still at it, despite the comparative briefness of the transmission. "Not this sample, anyhow. That, ladies and gentlemen, is code—no language consists exclusively of four-syllable words, of that you can be sure. What's more, it's a version of our code. I can't break it down very far—it takes a full-

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time expert to read this stuff—but I get the date and some of the sense. It's March 12, 3022, and there's some kind of a mass evacuation taking place. The message seems to be a routing order."

"But why will we be using code?" Dr. Wald wanted to know. "It implies that we think somebody might overhear us—somebody else with a Dirac. That could be very messy."

"It could indeed," Weinbaum said. "But we'll find out, I imagine. Give her another spin, Thor."

"Shall I try for a picture this time?"

Weinbaum nodded. A moment later, he was looking squarely into the green-skinned face of something that looked like an animated traffic signal with a helmet on it. Though the creature had no mouth, the Dirac speaker was saying quite clearly, "Hello, Chief. This is Thammos NGC 2287, transmission date Gor 60, 302 by my calendar, July 2, 2973 by yours. This is a lousy little planet. Everything stinks of oxygen, just like Earth. But the natives accept us and that's the important thing. We've got your genius safely born. Detailed report coming later by paw. NGC 2287 Thammos out."

"I wish I knew my New General Catalogue better," Weinbaum said. "Isn't that M 41 in Canis Major, the one with the red star in the middle? And we'll be using non-humanoids there! What *was* that creature, anyhow? Never mind, spin her again."

Dr. Wald spun her again. Weinbaum, already feeling a little dizzy, had given up taking notes. That could come later, all that could come later. Now he wanted only scenes and voices, more and more scenes and voices from the future. They were better than aquavit, even with a beer chaser.

III

THE indoctrination tape ended, and Krasna touched a button. The Dirac screen darkened, and folded silently back into the desk.

"They didn't see their way through to us, not by a long shot," he said. "They didn't see, for instance, that when one section of the government becomes nearly all-knowing — no matter how small it was to begin with—it necessarily becomes all of the government that there is. Thus the bureau turned into the Service and pushed everyone else out.

"On the other hand, those people did come to be afraid that a government with an all-knowing arm might become a rigid dictatorship. That couldn't happen and didn't happen, because the more you know, the wider your

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field of possible operation becomes and the more fluid and dynamic a society you need. How could a rigid society expand to other star-systems, let alone other galaxies? It couldn't be done."

"I should think it could," Jo said slowly. "After all, if you know in advance what everybody is going to do—"

"But we don't, Jo. That's just a popular fiction—or, if you like, a red herring. Not all of the business of the cosmos is carried on over the Dirac, after all. The only events we can ever overhear are those which are transmitted as a message. Do you order your lunch over the Dirac? Of course you don't. Up to now, you've never said a word over the Dirac in your life.

"And there's much more to it than that. All dictatorships are based on the proposition that government can somehow control a man's thoughts. We know now that the consciousness of the observer is the only free thing in the Universe. Wouldn't we look foolish trying to control that, when our entire physics shows that it's impossible to do so? That's why the Service is in no sense a thought police. We're interested only in acts. We're an Event Police."

"But why?" Jo said. "If all history is fixed, why do we bother with these boy-meets-girl assignments, for instance? The meetings will happen anyhow."

"Of course they will," Krasna agreed immediately. "But look, Jo. Our interests as a government depend upon the future. We operate *as if* the future is as real as the past, and so far we haven't been disappointed: the Service is 100% successful. But that very success isn't without its warnings. What would happen if we *stopped* supervising events? We don't know, and we don't dare take the chance. Despite the evidence that the future is fixed, we have to take on the role of the caretaker of inevitability. We believe that nothing can possibly go wrong . . . but we have to act on the philosophy that history helps only those who help themselves.

"That's why we safeguard huge numbers of courtships right through to contract, and even beyond it. We have to see to it that *every single person who is mentioned in any Dirac 'cast gets born.* Our obligation as Event Police is to make the events of the future possible, because those events are crucial to our society—even the smallest of them. It's an enormous task, believe me, and it gets bigger and bigger every day. Apparently it always will."

"Always?" Jo said. "What about the public? Isn't it going

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to smell this out sooner or later? The evidence is piling up at a terrific rate."

"Yes and no," Krasna said. "Lots of people are smelling it out right now, just as you did. But the number of new people we need in the Service grows faster—it's always ahead of the number of laymen who follow the clues to the truth."

JO took a deep breath. "You take all this as if it were as commonplace as boiling an egg, Kras," he said. "Don't you ever wonder about some of the things you get from the beep? That 'cast Dana Lje picked up from Canes Venatici, for instance, the one from the ship that was travelling backward in time? How is that possible? What could be the purpose? Is it—"

"*Pace, pace,*" Krasna said. "I don't know, and I don't care. Neither should you. That event is too far in the future for us to worry about. We can't possibly know its context yet, so there's no sense in trying to understand it. If an Englishman of around 1600 had found out about the American Revolution, he would have thought it a tragedy; an Englishman of 1950 would have a very different view of it. We're in the same spot. The messages we get from the really far future have no contexts yet."

"I think I see," Jo said. "I'll get used to it in time, I suppose, after I use the Dirac for a while. Or does my new rank authorize me to do that?"

"Yes, it does. But, Jo, first I want to pass on to you a rule of Service etiquette that must never be broken. You won't be allowed anywhere near a Dirac mike until you have it burned into your memory beyond any forgetfulness."

"I'm listening, Kras, believe me."

"Good. This is the rule: *The date of a Serviceman's death must never be mentioned in a Dirac 'cast.*"

Jo blinked, feeling a little chilly. The reason behind the rule was decidedly tough-minded, but its ultimate kindness was plain. He said, "I won't forget that. I'll want that protection myself. Many thanks, Kras. What's my new assignment?"

"To begin with," Krasna said, grinning, "as simple a job as I've ever given you, right here on Randolph. Skin out of here and find me that cab-driver—the one who mentioned time-travel to you. He's uncomfortably close to the truth; closer than you were in one category.

"Find him, and bring him to me. The Service is about to take in a new raw recruit!"

—JAMES BLISH

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The Boys From Vespis

By ARTHUR SELLINGS

It was all just a frightful mistake—but try convincing the Earthgirls that it was!

"I WON'T hear a word said against them," said Gillespie, the owner of the bar. "They're good clean-living lads."

"Unlike your regular customers, is that it?" Herbert demanded.

"I didn't say that. All I know is the Vespians are quiet—"

"—*dull*—"

"—sensible lads. They come in and have a drink or two, and that's that. No trouble, no fuss, no bellyaching." He looked meaningly at Herbert.

"What have *they* got to bellyache about?" asked Herbert angrily. "They come and land here. Nobody gets indignant, the way some of the natives have where our boys have landed. People treat them decently. Decently isn't the word for the way the girls treat them! I tell you, it's a revolting sight outside their ship. They've even put seats out on the green. Next thing, they'll get a neat little Vespian sextet together and throw dances twice a week with food and drinks free."

"That's what it boils down to, is it?" said Gillespie scornfully. "Primitive jealousy. That's a very uncivilized attitude to take toward our guests."

"Guests are somebody you invite. Anyway, it's a primitive matter. This isn't a big town. Girls never were plentiful. Now they look down their noses at us local men. That sort of thing doesn't interest you—or shouldn't at your age. It's all right for you

Illustrated by KOSSIN

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tradesmen, you pillars of the community. It's the younger generation who've got the complaints."

HERBERT warmed to his theme. "How would you like it if a distillery floated from space and set up shop next door, selling real liquor, not this hooch, at cut prices? That'd be a different story then, wouldn't it?"

"Now who's being insulting? If you don't like the liquor, why do you drink it?"

"Oh, yes, we can always sell it to the Vespians, can't we? And shortchange the good clean-living boys. I've seen you do it."

Gillespie grinned feebly. "That's no way to talk, Herbert," he said in half-hearted protest. "If the visitors are good for trade and make no trouble, why should we object? What benefits one benefits the community."

"You're not making speeches in the Chamber of Commerce now. What benefits you and your friends benefits me less than nothing. I tell you, Gillespie, trouble's brewing. The younger generation's going to get these guests of ours railroaded out of town."

"Now, now, remember the Interplanetary Welcome Statute. Any friendly visitors are welcome to Earth. Anyway, isn't it a nice change to have *human* visitors, after some of the specimens we have had?"

"Sure, sure. Most of the others never had a taste for liquor, or needed suits of clothes, or spent money on girls. But I'd much rather have any of the others, any day, than these black-haired Adonises with their damned perfect manners. The green lizards from Arcturus were more fun. And one of those crystals from Sirius could sing a four-part harmony all on his own. *They* had personality. All these Vespians are good for is to fill out their lousy opalescent shirts."

"They're fine shirts. I've got a couple myself. Perhaps you'd like me to try and get you one."

"Thanks, I can beg one for myself."

"Now that's not nice, Herbert. I didn't beg them. My daughter Doris took one of the lads home to tea and he brought them along for me—as a nice friendly gesture. Kind of a souvenir."

"Ain't that nice—*traitor!*"

Gillespie smirked. "You don't understand diplomacy. Friendliness encourages trade."

"You'd sell the planet from under our feet, if they made a good enough offer!"

"You've got them all wrong, Herbert. They're not here for trade. Little things like that are just ordinary acts of good will."

"Like taking the troublesome

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women off our hands for us. If they're not here for trade, what *are* they here for?"

"Now *that's* a stupid question. What do we go to other solar systems for? To map the Universe. To establish contact with the far-flung civilizations of the Galaxy."

"Anybody would think you were an astronaut to hear you talk. Anyway, the approach of this bunch is a whole lot too smooth for my liking. It's suspicious."

"Only to people with suspicious minds."

"YOU wait, my friend," said Herbert darkly. "You'll wake up one morning to find they've taken over the planet, or something like that. That's it—they probably picked on Centerville to study small-town psychology. You're probably down in their little red book. 'Dominant type—trademan. Vulnerable to smooth talk, opalescent shirts and approach through daughter.' All this goes back to Vespis, wherever Vespis is. By the way, I suppose you realize nobody has ever heard of Vespis. The big boys on Vespis give the word, and one morning we're being rounded up like cattle."

Gillespie laughed hollowly. "The extent to which some people's distorted imaginations will take them—"

"I can think of worse things. I can think it's suspicious that the Vespians come here with such a nice command of our language. That they fitted in so well from the start."

"Well, what's so funny about that? Other creatures have come here with a working knowledge of the language."

"Because Earthmen had already been to their system. We haven't been to Vespis yet."

"Well, I suppose they picked it up on their travels. Anyway, I don't see that it's anything to get all steamed up about. Perhaps they understand it by intuition."

"Telepaths, eh? Then why don't they *say* they're telepaths? Tell me that."

"There's no compulsion on anybody to say what he can do, is there?" Gillespie countered. "Besides, it wouldn't be like the Vespians to go around bragging about what they can and can't do. They're too modest."

"*They're too modest,*" Herbert mimicked scathingly. "They're so *phony!* You wait. I know. I've *got* it." He laughed mirthlessly. "They're probably here on a white-slaving expedition. They make such a hit with the women, with their good looks and smooth manners. But all that's just a blind. One of these days, they'll sweep all the women into their

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ship—under the guise of showing the sweet creatures how the darling spaceboat works. And then, when they're all safely on board, *clang* will go the ports, *bang* will go the rockets, and they'll all be on their way to the vice dens of Vespis."

Gillespie laughed uproariously.

"Decadence!" said Herbert bitterly. "Always, when a civilization is on the verge of catastrophe, you'll find it laughing at the prophets."

"Herbert," Gillespie said between spasms of laughter, "all this time I thought you were being serious. I've misjudged you in the past. If you can keep that up, I'll hire you as a floor show. Right now, have a drink on the house. You've earned it."

"I don't know that I should in such a traitorous bar. Only my present misery drives me to accept. Perhaps such a sacrifice of my principles will convince you of my desperation and high seriousness."

Gillespie only laughed again as he turned to get the promised drink.

AT that moment, a Vespian, with the inevitable girl on his arm, walked into the bar. Herbert recognized the girl as one he'd dated a couple of times himself a year or so back. The change in her was remarkable. Then, he'd thought her rather almost surly. Now, she was laughing at the Vespian and sparkling with pleasure. Herbert winced.

Gillespie hastily slapped Herbert's drink down in front of him and concentrated on the Vespian, who ordered up with that delicate trace of unknown accent. As Gillespie hurried about his order in a way he would have done for no local inhabitant, the Vespian smiled amiably at Herbert and bowed graciously.

Herbert forced his face into a stiff smile. The Vespian led his girl to a booth. Herbert swore under his breath. He had to hand it to them—they were certainly smooth. Perhaps you couldn't really blame the girls. But there ought to be a law against it. Herbert was too consumed with jealousy to be surprised at finding himself on the side of the Puritans for once. But there ought to be something. There ought to be—that was it—there ought to be some technicality they'd infringed.

He racked his brains. *Illegal entry?* No, there was a special dispensation for interplanetary visitors in that respect. A routine matter of inspection of the ship, impounding of any weapons or dangerous mechanisms, checks for radioactivity and bacteria. The Vespians had been properly cleared. *Customs or currency in-*

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fringements? Again, that didn't apply to interplanetary visitors. There was even the I.W.F., the Interplanetary Welcome Fund, for those who needed it. The Vespians had come well-loaded with gold, anyway. That, come to think of it, was another example of their suspicious preparedness.

"I tell you—" he started to say to Gillespie, but Gillespie was leaning on the counter, smiling benignly in the direction of the Vespian and his girl friend. There was a faraway look on his face, as if he heard the sweet music of a symphony for cash registers.

"Yes?" Gillespie asked dreamily, without turning.

"Oh, forget it," said Herbert, draining his drink and sliding off his stool. "I'm going to do something. I'm going to picket their ship. Or—or something."

THE evening scene, just outside the town, was like a delicate landscape by Watteau. Apart, that is, from the curving brightness of the ship and the costumes of the human and Vespian figures. In the dying light of the spring day, couples were stretched out on the grass, or seated on the green rustic seats that the Vespians had thoughtfully provided. Laughter and the sound of soft voices would have sounded idyllic to Herbert in another setting—with himself as participant.

As he approached the green, faery lamps broke into a thousand soft points of multicolored light. Herbert grumbled at this latest bit of Vespian stage-managing. He grumbled again when he noticed the mobile cafeteria. But this was a purely terrestial enterprise. If things went on like this, there'd be a small town clustered around the ship before long.

Apart from the cafeteria attendant, he seemed to be the only home-planet male around. The girls looked at him as if *this* were Vespis and *he* were the intruder. The Vespians just smiled courteously.

He flopped down on the grass before his legs sent him careering around the ship, yelling like a prophet of hellfire. He brooded. There had to be some way, some plan of action. Perhaps, if he stayed long enough, he'd spot the Vespians committing a breach of some minor bylaw or other, and he could get an injunction.

But he looked about him for a long time, while the shadows grew longer and longer and finally merged, and he noticed nothing exceptionable. The Vespians conducted themselves with the utmost decorum. They seemed not to mind his presence in the least. But the eyes of the girls began

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to flash whitely in the twilight, whitely — and *dangerously* — Herbert thought. An alarming image of himself being lynched by a horde of angry women flashed across his mind.

On a sudden impulse, he rose and crossed to the main port of the Vespian ship. There was only one thing to do—talk this matter over with the Vespians, man to, so to speak, man. If he could show them that their conduct was resented, they might lay off.

The Vespian sentry lolling elegantly at the foot of the ramp hardly looked like a guard, but that was his function, Herbert supposed.

"I want to see the big man," said Herbert gruffly.

"Ah, yes," said the Vespian, flashing a bright smile. "He may be in conference, but I'll see. Who shall I say is calling?"

It was too disarming.

"Er—Mr. Herbert Plumtree." He cursed inwardly to find himself adding, in a polite tone he had not intended, "Er—on a social matter."

"Certainly," said the Vespian. "Excuse me." He seemed to frown down at his shirt for a moment, then looked up. "Certainly, Mr. Plumtree. This way, if you please." And he led Herbert up the ramp, down a softly lit corridor, into a small room and the presence of a Vespian even more handsome, if that were possible, than the usual run of his breed.

The Vespian rose courteously from his desk and stretched out his hand. "Good evening, Mr. Plumtree. Is there anything I can do for you?"

"I—I—" Herbert floundered. "Yes, there is. Correct as your men are in their behavior, I, as a deputation of one, would be very glad to see their handsome backs."

"See their backs? Oh, yes. But, Mr. Plumtree—" the Vespian looked genuinely hurt—"I'm very sorry to hear that. Very sorry indeed. How have we given offense? If any of my men . . ."

"There's nothing personal in it," said Herbert.

HE explained, briefly, the upsetting effect that the Vespians were having on the balance of the sexes in the small town.

"Oh, dear!" said the Vespian chief when Herbert had finished. "Oh, dear me, I hadn't thought of that."

He appeared to be in such a state of perturbation that Herbert's worst suspicions were reawakened.

"Look here," he said, feeling absurdly like a hero in an oldtime Western story. "Don't act so damned innocent about it. You're exactly the same as us. You

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can't pretend you weren't aware of the effect you'd have. If you don't clear out, I'm going to the authorities about it."

The Vespian became very agitated. His smooth Vespian manners momentarily deserted him.

"But, Mr. Plumtree, surely you don't—surely you wouldn't . . . It was harmless, I assure you. We meant no harm."

"Well, you've caused plenty."

The Vespian said, "Do you mind if I consult my associates about this? Er—perhaps you'd like a drink?"

"No, thank you," said Herbert stiffly. It would probably be drugged anyway, he told himself.

"Well, er—please excuse me a moment, if you will."

And the agitated Vespian slid out through a door at the end of the room.

Herbert felt a mixed sensation of triumph—and fear. This was the classical moment to make a dash for it. Or was it? He hadn't found any real clue to the purpose of the Vespians yet. In his mind's ear, he heard the roar of rockets as the alarmed Vespians took to their space-heels, bearing him off a captive. Or were they preparing a worse fate for him? After all, the only ones who had seen him enter the ship were the women outside, and he somehow felt that they would not be willing witnesses against their too-handsome swains. Well, if he had to be a martyr, perhaps the other fellows, when they woke up to what he had done for them, would erect a monument on the site.

But no rockets sounded, no lethal gas hissed into the room. Instead, the door opened again and the chief Vespian came back, accompanied by two others.

"Ah, Mr. Plumtree, I'm sorry. I hope my little flurry did not alarm you," said the alien leader.

Steady, steady, Herbert told himself, and waited without replying.

"My associates here are of the same opinion as myself. We agree that we should tell you of our purpose in behaving as we have."

"Ah, so you *do* admit you had an ulterior purpose—"

"Certainly, Mr. Plumtree. Well, not exactly a purpose—rather, a stratagem. It's one we adopt on all the inhabited planets we visit. It had always been successful before. We did not realize that what evidently has happened here *could* happen. We made a slight error in our calculations and, believe me, we are both distressed and pained."

THE Vespian smiled a smile of aching sincerity.

They're playing for time, thought Herbert. *Probably stoking up the rockets.*

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"Come to the point," he said.

"We—well . . ." The Vespian hesitated, then said, "I've communed with my associates and we are convinced that the best course is to tell you the situation. We haven't ever had to do so before, but such an awkward problem as this has never arisen before. We seek to cause as little distress as possible to the inhabitants of the planets we visit, which was the reason for our stratagem in the first place. You see—" he spread his hands in a gesture of heartfelt apology—"we're not at all as you see us. In fact, we're not really humanoid at all."

"What!"

"No, I assure you, Mr. Plumtree, that we are not. I could prove it to you—let down the guard, as it were. But we have found, from distressing experience, that of all possible aspects, ours is one which universally strikes the inhabitants of the rest of the Galaxy with, I am sorry to say, fear, panic and often outright hostility. I hope you can appreciate that, Mr. Plumtree, and perhaps understand our feelings. Of course, to ourselves, in our natural state, we consider ourselves quite good-looking. And we are actually the kindest of creatures.

"It wasn't so much that our feelings were—well, a trifle hurt. More important, it was extremely difficult for us to carry on our peaceful researches on worlds where our presence was so strongly resented. So we learned to adapt ourselves to the ideal types of the people we meet."

"You can do that?" asked Herbert, astonished.

"It was not easy at first, but we have grown quite proficient at it."

"I don't believe you," Herbert said flatly.

"Mr. Plumtree," said the Vespian, "I told you I could prove it to you. I could give you a flicker. But you wouldn't like it."

"Go on," Herbert said stoutly. "I dare you."

"All right." The Vespian looked worriedly resigned. "But please don't hold it against me. You asked for it. Ready?"

"Ready."

The Vespian flickered for a moment.

"All right, all right," gasped Herbert weakly. "I believe you."

"You see," said the Vespian, "when we came to your planet, we evidently did our job too well. The men we made ourselves into are too perfect. And now that I've told you the facts, we'd better move on." He sighed heavily. "It will be a pity, because we rather like your planet and we still have a lot of research to do." He smiled wanly at Herbert.

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"We *do* conduct research, of course. We don't spend all our time with your girls."

He coughed. "I'm sorry to harp upon a subject that is so painful to you. But you do understand, don't you? It was only in the interest of good relations. We have done nothing—nothing at all—to encourage your girls."

HERBERT was surprised to find himself feeling sorry for them.

He brightened. "Why don't you just modify the Adonis model? You could make yourselves just a *little* repulsive."

The Vespian laughed regretfully. "Your girls know so many of us by now that they've given us pet names. They'd be surprised at the change. No, I'm afraid it's too late for that now."

"Mm — I suppose so," said Herbert. Then the thought struck him. "*So many?* Does that mean that *all* your crew are not accounted for?"

"No, there are a few who've stayed aboard ship since we landed. Researchers, mechanics."

"Well, I've got a request to make," Herbert said, "and I think it might be a solution for both of us." He suddenly felt guilty and a traitor. But after all, he told himself, it wasn't altruism that had brought him here—there was no altruism in matters like this. He outlined his idea to the Vespians.

"Well," he finished, "do you think you can do it?" A fresh twinge of guilt seized him. "And you could keep a few—er—in stock, as it were."

"And you would tell nobody else about this?"

Herbert grinned. "Do you think for one moment I would?"

The Vespian grinned, too. "No, I think not. Yes, it can be done. If you'll just hold on a moment."

"Oh, just one thing," said Herbert.

"Yes?"

"Don't let down your standards of craftmanship."

"We won't," promised the Vespian.

And when he returned with what Herbert had asked for, it was quite obvious that they hadn't.

When Herbert finally could speak, he said, "What — what shall I call you?"

"Call me what you wish."

The voice, and the smile that accompanied it, besides sending a shiver of delight down Herbert's spine, reminded him of someone he'd seen every chance he'd had, but had, unfortunately and inevitably, never met.

"Will *Rita* do?" he asked.

"*Rita?* Yes, I should love you to call me Rita."

—ARTHUR SELLINGS

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Pet Farm

By ROGER DEE

The next worst thing to hell is being shanghaied into the Paradise of an alien planet!

Illustrated by DICK FRANCIS

THEY had fled almost to the sheer ambient face of the crater wall when the Falakian girl touched Farrell's arm and pointed back through the scented, pearly mists.

"Someone," she said. Her voice stumbled over the almost forgotten Terran word, but its sound was music.

"No matter," Farrell answered. "They're too late now."

He pushed on, happily certain in his warm euphoric glow of mounting expectancy that what he had done to the ship made him —and his new-found paradise with him—secure.

He had almost forgotten who *they* were; the pale half-memories that drifted through his mind touched his consciousness lightly and without urgency, arousing neither alarm nor interest.

The dusk grew steadily deeper, but the dimming of vision did not matter.

Nothing mattered but the fulfillment to come.

Far above him, the lacy network of bridging, at one time so baffling, arched and vanished in airy grace into the colored mists. To right and left, other arms of the aerial maze reached out, throwing vague traceries from cliff to cliff across the valley floor. Behind him on the plain he could hear the eternally young people

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playing about their little blue lake, flitting like gay shadows through the tamarisks and calling to each other in clear elfin voices while they frolicked after the fluttering swarms of great, bright-hued moths.

The crater wall halted him and he stood with the Falakian girl beside him, looking back through the mists and savoring the sweet, quiet mystery of the valley. Motion stirred there; the pair of them laughed like anticipant children when two wide-winged moths swam into sight and floated toward them, eyes glowing like veiled emeralds.

Footsteps followed, disembodied in the dusk.

"It is only Xavier," a voice said. Its mellow uninflection evoked a briefly disturbing memory of a slight gray figure, jointed yet curiously flexible, and a featureless oval of face.

It came out of the mists and halted a dozen yards away, and he saw that it spoke into a metallic box slung over one shoulder.

"He is unharmed," it said. "Directions?"

Xavier? Directions? From whom?

Another voice answered from the shoulder-box, bringing a second mental picture of a face—square and brown, black-browed and taciturnly humorless—that he had known and forgotten.

Whose, and where?

"Hold him there, Xav," it said. "Stryker and I are going to try to reach the ship now."

The moths floated nearer, humming gently.

"You're too late," Farrell called. "Go away. Let me wait in peace."

"If you knew what you're waiting for," a third voice said, "you'd go screaming mad." It was familiar, recalling vaguely a fat, good-natured face and ponderous, laughter-shaken paunch. "If you could see the place as you saw it when we first landed . . ."

The disturbing implications of the words forced him reluctantly to remember a little of that first sight of Falak.

. . . The memory was sacrilege, soiling and cheapening the ecstasy of his anticipation.

But it *had* been different.

HIS first day on Falak had left Farrell sick with disgust.

He had known from the beginning that the planet was small and arid, non-rotating, with a period of revolution about its primary roughly equal to ten Earth years. The *Marco Four*'s initial sweep of reconnaissance, spiraling from pole to pole, had supplied further information without preparing him at all for what the three-man Reclamations team was to find later.

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The weed-choked fields and crumbled desolation of Terran slave barracks had been depressing enough. The inevitable scattering of empty domes abandoned a hundred years before by the Hymenop conquerors had completed a familiar and unpromising pattern, a workaday blueprint that differed from previous experience only in one significant detail: There was no shaggy, disoriented remnant of descendants from the original colonists.

The valley, a mile-wide crater sunk between thousand-foot cliffs, floored with straggling bramble thickets and grass flats pocked with stagnant pools and quaking slime-bogs, had been infinitely worse. The cryptic three-dimensional maze of bridges spanning the pit had made landing there a ticklish undertaking. Stryker and Farrell and Gibson, after a conference, had risked the descent only because the valley offered a last possible refuge for survivors.

Their first real hint of what lay ahead of them came when Xavier, the ship's mechanical, opened the personnel port against the heat and humid stink of the place.

"Another damned tropical pesthole," Farrell said, shucking off his comfortable shorts and donning booted coveralls for the preliminary survey. "The sooner we count heads—assuming there are any left to count—and get out of here, the better. The long-term Reorientation boys can have this one and welcome."

Stryker, characteristically, had laughed at his navigator's prompt disgust. Gibson, equally predictable in his way, had gathered his gear with precise efficiency, saying nothing.

"It's a routine soon finished," Stryker said. "There can't be more than a handful of survivors here, and in any case we're not required to do more than gather data from full-scale recolonization. Our main job is to prepare Reorientation if we can for whatever sort of slave-conditioning deviltry the Hymenops practiced on this particular world."

Farrell grunted sourly. "You love these repulsive little puzzles, don't you?"

STRYKER grinned at him with good-natured malice. "Why not, Arthur? You can play the accordion and sketch for entertainment, and Gib has his star-maps and his chess sessions with Xavier. But for a fat old man, rejuvenated four times and nearing his fifth and final, what else is left except curiosity?"

He clipped a heat-gun and audicom pack to the belt of his bulging coveralls and clumped to the port to look outside. Roiling gray fog hovered there, diffusing

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the hot magenta point of Falak's sun to a liverish glare half-eclipsed by the crater's southern rim. Against the light, the spidery metal maze of foot-bridging stood out dimly, tracing a random criss-cross pattern that dwindled to invisibility in the mists.

"That network is a Hymenop experiment of some sort," Stryker said, peering. "It's not only a sample of alien engineering—and a thundering big one at that—but an object lesson on the weird workings of alien logic. If we could figure out what possessed the Bees to build such a maze here—"

"Then we'd be the first to solve the problem of alien psychology," Farrell finished acidly, aping the older man's ponderous enthusiasm. "Lee, you know we'd have to follow those hive-building fiends all the way to 70 Ophiuchi to find out what makes them tick. And twenty thousand light-years is a hell of a way to go out of curiosity, not to mention a dangerous one."

"But we'll go there some day," Stryker said positively. "We'll have to go because we can't ever be sure they won't try to repeat their invasion of two hundred years ago."

He tugged at the owlish tufts of hair over his ears, wrinkling his bald brow up at the enigmatic maze.

"We'll never feel safe again until the Bees are wiped out. I wonder if they know that. They never understood us, you know, just as we never understood them—they always seemed more interested in experimenting with slave ecology than in conquest for itself, and they never killed off their captive cultures when they pulled out for home. I wonder if their system of logic can postulate the idea of a society like ours, which must rule or die."

"We'd better get on with our survey," Gibson put in mildly, "unless we mean to finish by floodlight. We've only about forty-eight hours left before dark."

HE moved past Stryker through the port, leaving Farrell to stare blankly after him.

"This is a non-rotating world," Farrell said. "How the devil *can* it get dark, Lee?"

Stryker chuckled. "I wondered if you'd see that. It can't, except when the planet's axial tilt rolls this latitude into its winter season and sends the sun south of the crater rim. It probably gets dark as pitch here in the valley, since the fog would trap even diffused light." To the patiently waiting mechanical, he said, "The ship is yours, Xav. Call us if anything turns up."

Farrell followed him reluctant-

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ly outside into a miasmic desolation more depressing than he could have imagined.

A stunted jungle of thorny brambles and tough, waist-high grasses hampered their passage at first, ripping at coveralls and tangling the feet until they had beaten their way through it to lower ground. There they found a dreary expanse of bogland where scummy pools of stagnant water and festering slime heaved sluggishly with oily bubbles of marsh gas that burst audibly in the hanging silence. The liverish blaze of Falakian sun bore down mercilessly from the crater's rim.

They moved on to skirt a small lead-colored lake in the center of the valley, a stagnant seepage-basin half obscured by floating scum. Its steaming mud-flats were littered with rotting yellowed bones and supported the first life they had seen, an unpleasant scurrying of small multipedal crustaceans and water-lizards.

"There can't be any survivors *here*," Farrell said, appalled by the thought of his kind perpetuating itself in a place like this. "God, think what the mortality rate would be! They'd die like flies."

"There are bound to be a few," Stryker stated, "even after a hundred years of slavery and another hundred of abandonment. The human animal, Arthur, is the most fantastically adaptable—"

He broke off short when they rounded a clump of reeds and stumbled upon their first Falakian proof of that fantastic adaptability.

THE young woman squatting on the mudflat at their feet stared back at them with vacuous light eyes half hidden behind a wild tangle of matted blonde hair. She was gaunt and filthy, plastered with slime from head to foot, and in her hands she held the half-eaten body of a larger crustacean that obviously had died of natural causes and not too recently, at that.

Farrell turned away, swallowing his disgust. Gibson, unmoved, said with an aptness bordering—for him—on irony: "Too damned adaptable, Lee. Sometimes our kind survives when it really shouldn't."

A male child of perhaps four came out of the reeds and stared at them. He was as gaunt and filthy as the woman, but less vapid of face. Farrell, watching the slow spark of curiosity bloom in his eyes, wondered sickly how many years—or how few—must pass before the boy was reduced to the same stupid bovinity as the mother.

Gibson was right, he thought. The compulsion to survive at any cost could be a curse instead of

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an asset. The degeneracy of these poor devils was a perpetual affront to the race that had put them there.

He was about to say as much when the woman rose and plodded away through the mud, the child at her heels. It startled him momentarily, when he followed their course with his eyes, to see that perhaps a hundred others had gathered to wait incuriously for them in the near distance. All were as filthy as the first two, but with a grotesque uniformity of appearance that left him frowning in uneasy speculation until he found words to identify that similarity.

"They're all *young*," he said. "The oldest can't be more than twenty—twenty-five at most!"

Stryker scowled, puzzled without sharing Farrell's unease. "You're right. Where are the older ones?"

"Another of your precious little puzzles," Farrell said sourly. "I hope you enjoy unraveling it."

"Oh, we'll get to the bottom of it," Stryker said with assurance. "We'll have to, before we can leave them here."

They made a slow circuit of the lake, and the closer inspection offered a possible solution to the problem Stryker had posed. Chipped and weathered as the bones littering the mudflats were, their grisly shapings were unmistakable.

"I'd say that these are the bones of the older people," Stryker hazarded, "and that they represent the end result of another of these religio-economic control compulsions the Hymenops like to condition into their slaves. Men will go to any lengths to observe a tradition, especially when its origin is forgotten. If these people were once conditioned to look on old age as intolerable—"

"If you're trying to say that they kill each other off at maturity," Farrell interrupted, "the inference is ridiculous. In a hundred years they'd have outgrown a custom so hard to enforce. The balance of power would have rested with the adults, not with the children, and adults are generally fond of living.

STRYKER looked to Gibson for support, received none, and found himself saddled with his own contention. "Economic necessity, then, since the valley can support only a limited number. Some of the old North American Indians followed a similar custom, the oldest son throttling the father when he grew too old to hunt."

"But even there infanticide was more popular than patricide," Farrell pointed out. "No group would practice decimation from

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the top down. It's too difficult to enforce."

Stryker answered him with a quotation from the Colonial Reclamations Handbook, maliciously taking the pontifical classmaster's tone best calculated to irritate Farrell.

"Chapter Four, Subsection One, Paragraph Nineteen: *Any custom, fixation or compulsion accepted as the norm by one group of human beings can be understood and evaluated by any other group not influenced by the same ideology, since the basic perceptive abilities of both are necessarily the same through identical heredity. Evaluation of alien motivations, conversely—*"

"Oh, hell," Farrell cut in wearily. "Let's get back to the ship, shall we? We'll all feel more like—"

His right foot gave way beneath him without warning, crushing through the soft ground and throwing him heavily. He sat up at once, and swore in incredulous anger when he found the ankle swelling rapidly inside his boot.

"Sprained! Damn it all!"

Gibson and Stryker, on their knees beside the broken crust of soil, ignored him. Gibson took up a broken length of stick and prodded intently in the cavity, prying out after a moment a glistening two-foot ellipsoid that struggled feebly on the ground.

"A chrysalid," Stryker said, bending to gauge the damage Farrell's heavy boot had done. "In a very close pre-eclosion stage. Look, the protective sheathing has begun to split already."

The thing lay twitching aimlessly, prisoned legs pushing against its shining transparent integument in an instinctive attempt at premature freedom. The movement was purely reflexive; its head, huge-eyed and as large as a man's clenched fist, had been thoroughly crushed under Farrell's heel.

Oddly, its injury touched Farrell even through the pain of his injured foot.

"It's the first passably handsome thing we've seen in this pesthole," he said, "and I've maimed it. Finish it off, will you?"

Stryker grunted, feeling the texture of the imprisoning sheath with curious fingers. "What would it have been *in imago,* Gib? A giant butterfly?"

"A moth," Gibson said tersely. "*Lepidoptera,* anyway."

He stood up and ended the chrysalid's strugglings with a bolt from his heat-gun before extending a hand to help Farrell up. "I'd like to examine it closer, but there'll be others. Let's get Arthur out of here."

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THEY went back to the ship by slow stages, pausing now and then while Gibson gathered a small packet of bone fragments from the mudflats and underbrush.

"Some of these are older than others," he explained when Stryker remarked on his selection. "But none are recent. It should help to know their exact age."

An hour later, they were bathed and dressed, sealed off comfortably in the ship against the humid heat and stink of the swamp. Farrell lay on a chart room acceleration couch, resting, while Stryker taped his swollen ankle. Gibson and Xavier, the one disdaining rest and the other needing none, used the time to run a test analysis on the bones brought in from the lakeside.

The results of that analysis were more astonishing than illuminating.

A majority of the fragments had been exposed to climatic action for some ten years. A smaller lot averaged twenty years; and a few odd chips, preserved by long burial under alluvial silt, thirty.

"The older natives died at ten-year intervals, then," Stryker said. "And in considerable numbers; the tribe must have been cut to half strength each time. But why?" He frowned unhappily, fishing for opinion. "Gib, can it really be a perversion of religious custom dreamed up by the Hymenops to keep their slaves under control? A sort of festival of sacrifice every decade, climaxing in tribal decimation?"

"Maybe they combine godliness with gluttony," Farrell put in, unasked. "Maybe their orgy runs more to long pig than to piety."

He stood up, wincing at the pain, and was hobbling toward his sleeping cubicle when Gibson's answer to Stryker's question stopped him with a cold prickle along his spine.

"We'll know within twenty-four hours," Gibson said. "Since both the decimations and the winter darkness periods seem to follow the same cycle, I'd say there's a definite relationship."

FOR once Farrell's cubicle, soundproofed and comfortable, brought him only a fitful imitation of sleep, an intermittent dozing that wavered endlessly between nightmare and wakefulness. When he crawled out again, hours later, he found Xavier waiting for him alone with a thermobulb of hot coffee. Stryker and Gibson, the mechanical said blandly, had seen no need of waking him, and had gone out alone on a more extensive tour of investigation.

The hours dragged intermin-

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ably. Farrell uncased his beloved accordion, but could not bear the sound of it; he tried his sketchbook, and could summon to mind no better subjects than drab miasmic bogs and steaming mudflats. He discarded the idea of chess with Xavier without even weighing it—he would not have lasted past the fourth move, and both he and the mechanical knew it.

He was reduced finally to limping about the ship on his bandaged foot, searching for some routine task left undone and finding nothing. He even went so far as to make a below-decks check on the ship's matter-synthesizer, an indispensable unit designed for the conversion of waste to any chemical compound, and gave it up in annoyance when he found that all such operational details were filed with infallible exactness in Xavier's plastoid head.

The return of Stryker and Gibson only aggravated his impatience. He had expected them to discover concealed approaches to the maze of bridging overhead, tunnelings in the cliff-face to hidden caverns complete with bloodstained altars and caches of sacrificial weapons, or at least some ominous sign of preparation among the natives. But there was nothing.

"No more than yesterday," Stryker said. Failure had cost him a share of his congenital good-humor, leaving him restless and uneasy. "There's nothing to find, Arthur. We've seen it all."

Surprisingly, Gibson disagreed.

"We'll know what we're after when darkness falls," he said. "But that's a good twelve hours away. In the meantime, there's a possibility that our missing key is *outside* the crater, rather than here inside it."

THEY turned on him together, both baffled and apprehensive.

"What do you mean, outside?" Farrell demanded. "There's nothing there but grassland. We made sure of that at planetfall."

"We mapped four Hymenop domes on reconnaissance," Gibson reminded him. "But we only examined three to satisfy ourselves that they were empty. The fourth one—"

Farrell interrupted derisively. "That ancient bogey again? Gib, the domes are *always* empty. The Bees pulled out a hundred years ago."

Gibson said nothing, but his black-browed regard made Farrell flush uncomfortably.

"Gib is right," Stryker intervened. "You're too young in Colonial Reclamations to appreciate the difficulty of recognizing an alien logic, Arthur, let alone the impossibility of outguessing it. I've knocked about these

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ecological madhouses for the better part of a century, and the more I see of Hymenop work, the more convinced I am that we'll never equate human and Hymenop ideologies. It's like trying to add quantities of dissimilar objects and expressing the result in a single symbol; it can't be done, because there's no possible common denominator for reducing the disparate elements to similarity."

WHEN Farrell kept silent, he went on, "Our own reactions, and consequently our motivations, are based on broad attributes of love, hate, fear, greed and curiosity. We might empathize with another species that reacts as we do to those same stimuli—but what if that other species recognizes only one or two of them, or none at all? What if their motivations stem from a set of responses entirely different from any we know?"

"There aren't any," Farrell said promptly. "What do you think would they be?"

"There you have it," Stryker said triumphantly. He chuckled, his good-nature restored. "We can't imagine what those emotions would be like because we aren't equipped to understand. Could a race depending entirely on extra-sensory perception appreciate a Mozart quintet or a Botticelli altar piece or a performance of *Hamlet?* You know it couldn't—the esthetic nuances that make those works great would escape it completely, because the motives that inspired their creation are based on a set of values entirely foreign to its comprehension.

"There's a digger wasp on Earth whose female singles out a particular species of tarantula to feed her larvae—and the spider stands patiently by, held by some compulsion whose nature we can't even guess, while the wasp digs a grave, paralyzes the spider and shoves it into the hole with an egg attached. The spider could kill the wasp, and will kill one of any other species, but it submits to that particular kind without a flicker of protest. And if we can't understand the mechanics of such a relationship between reflexive species, then what chance have we of understanding the logic of an *intelligent* race of aliens? The results of its activities can be assessed, but not the motivations behind those activities."

"All right," Farrell conceded. "You and Gib are right, as usual, and I'm wrong. We'll check that fourth dome."

"You'll stay here with Xav," Stryker said firmly, "while Gib and I check. You'd only punish yourself, using that foot."

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AFTER another eight-hour period of waiting, Farrell was nearing the end of his patience. He tried to rationalize his uneasiness and came finally to the conclusion that his failing hinged on a matter of conditioning. He was too accustomed to the stable unity of their team to feel comfortable without Gibson and Stryker. Isolated from their perpetual bickering and the pleasant unspoken warmth of their regard, he was lonesome and tense.

It would have been different, he knew, if either of the others had been left behind. Stryker had his beloved Reclamations texts and his microfilm albums of problems solved on other worlds; Gibson had his complicated galactic charts and his interminable chess bouts with Xavier . . .

Farrell gave it up and limped outside, to stand scowling unhappily at the dreary expanse of swampland. Far down under the reasoning levels of his consciousness a primal uneasiness nagged at him, whispering in wordless warning that there was more to his mounting restlessness than simple impatience. Something inside him was changing, burgeoning in strange and disturbing growth.

A pale suggestion of movement, wavering and uncertain in the eddying fog, caught his eye. A moment of puzzled watching told him that it was the bedraggled young woman they had seen earlier by the lake, and that she was approaching the ship timorously and under cover.

"But why?" he wondered aloud, recalling her bovine lack of curiosity. "What the devil can she want here?"

A shadow fell across the valley. Farrell, startled, looked up sharply to see the last of the Falakian sun's magenta glare vanishing below the crater's southern rim. A dusky forerunner of darkness settled like a tangible cloud, softening the drab outlines of bramble thickets and slime pools. The change that followed was not seen but felt, a swelling rush of glad arousal like the joy of a child opening its eyes from sleep.

To Farrell, the valley seemed to stir, waking in sympathy to his own restlessness and banishing his unease.

THE girl ran to him through the dusk on quick, light feet, timidity forgotten, and he saw with a pleasant shock of astonishment that she was no longer the filthy creature he had first seen by the lakeside. She was pretty and nubile, eyes and soft mouth smiling together in a childlike eagerness that made her at once infinitely desirable and untouchably innocent.

"Who are you?" he asked shak-

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ily.

Her hesitant voice was music, rousing in Farrell a warm and expectant euphoria that glowed like old wine in his veins.

"Koaele," she said. "Look—"

Behind her, the valley lay wrapped like a minor paradise in soft pearly mists and luminous shadows, murmurous with the far sound of running water and the faint chiming of voices that drifted up from the little blue lake to whisper back in cadenced echo from the fairy maze of bridging overhead. Over it all, like a deep, sustained cello note, rose the muted humming of great flame-winged moths dipping and swaying over bright tropical flowers.

"*Moths?*" he thought. And then, "*Of course.*"

The chrysalids under the sod, their eclosion time completed, were coming into their own—bringing perfection with them. Born in gorgeous iridescent *imago,* they were beautiful in a way that hurt with the yearning pain of perfection, the sorrow that imperfection existed at all—the joy of finally experiencing flawlessness.

An imperative buzzing from the ship behind him made a rude intrusion. A familiar voice, polite but without inflection, called from an open port: "Captain Stryker in the scoutboat, requesting answer."

Farrell hesitated. To the girl, who followed him with puzzled, eager eyes, he begged, "Don't run away, *please.* I'll be back."

In the ship, Stryker's moon-face peered wryly at him from the main control screen.

"Drew another blank," it said. "You were right after all, Arthur—the fourth dome was empty. Gib and I are coming in now. We can't risk staying out longer if we're going to be on hand when the curtain rises on our little mystery."

"Mystery?" Farrell echoed blankly. Earlier discussions came back slowly, posing a forgotten problem so ridiculous that he laughed. "We were wrong about all that. It's wonderful here."

STRYKER'S face on the screen went long with astonishment. "Arthur, have you lost your mind? *What's wrong there?*"

"Nothing is wrong," Farrell said. "It's *right.*" Memory prodded him again, disturbingly. "Wait—I remember now what it was we came here for. But we're not going through with it."

He thought of the festival to come, of the young men and girls running lithe in the dusk, splashing in the lake and calling joyously to each other across the pale sands. The joyous innocence of their play brought an appalling realization of what would happen

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if the fat outsider on the screen should have his way:

The quiet paradise would be shattered and refashioned in smoky facsimile of Earth, the happy people herded together and set to work in dusty fields and whirring factories, multiplying tensions and frustrations as they multiplied their numbers.

For what? For whom?

"You've got no right to go back and report all this," Farrell said plaintively. "You'd ruin everything."

The alternative came to him and with it resolution. "But you won't go back. I'll see to that."

He left the screen and turned on the control panel with fingers that remembered from long habit the settings required. Stryker's voice bellowed frantically after him, unheeded, while he fed into the ship's autopilot a command that would send her plunging skyward bare minutes later.

Then, ignoring the waiting mechanical's passive stare, he went outside.

The valley beckoned. The elfin laughter of the people by the lake touched a fey, responsive chord in him that blurred his eyes with ecstatic tears and sent him running down the slope, the Falakian girl keeping pace beside him.

Before he reached the lake, he had dismissed from his mind the ship and the men who had brought it there.

BUT they would not let him forget. The little gray jointed one followed him through the dancing and the laughter and cornered him finally against the sheer cliffside. With the chase over, it held him there, waiting with metal patience in the growing dusk.

The audicom box slung over its shoulder boomed out in Gibson's voice, the sound a noisy desecration of the scented quiet.

"Don't let him get away, Xav," it said. "We're going to try for the ship now."

The light dimmed, the soft shadows deepened. The two great-winged moths floated nearer, humming gently, their eyes glowing luminous and intent in the near-darkness. Mist currents from their approach brushed Farrell's face, and he held out his arms in an ecstasy of anticipation that was a consummation of all human longing.

"*Now,*" he whispered.

The moths dipped nearer.

The mechanical sent out a searing beam of orange light that tore the gloom, blinding him briefly. The humming ceased; when he could see again, the moths lay scorched and blackened at his feet. Their dead eyes looked up at him dully, charred and empty; their bright gauzy

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wings smoked in ruins of ugly, whiplike ribs.

He flinched when the girl touched his shoulder, pointing. A moth dipped toward them out of the mists, eyes glowing like round emerald lanterns. Another followed.

The mechanical flicked out its orange beam and cut them down.

A roar like sustained thunder rose across the valley, shaking the ground underfoot. A column of white-hot fire tore the night.

"The ship," Farrell said aloud, remembering.

He had a briefly troubled vision of the sleek metal shell lancing up toward a black void of space powdered with cold star-points whose names he had forgotten, marooning them all in Paradise.

The audicom boomed in Gibson's voice, though oddly shaken and strained. "Made it. Is he still safe, Xav?"

"Safe," the mechanical answered tersely. "The natives, too, so far."

"No thanks to *him*," Gibson said. "If you hadn't canceled the blastoff order he fed into the autopilot . . ." But after a moment of ragged silence: "No, that's hardly fair. Those damned moths beat down Lee's resistance in the few minutes it took us to reach the ship, and nearly got me as well. Arthur was exposed to their influence from the moment they started coming out."

Stryker's voice cut in, sounding more shaken than Gibson's. "Stand fast down there. I'm setting off the first flare now."

A SILENT explosion of light, searing and unendurable, blasted the night. Farrell cried out and shielded his eyes with his hands, his ecstasy of anticipation draining out of him like heady wine from a broken urn. Full memory returned numbingly.

When he opened his eyes again, the Falakian girl had run away. Under the merciless glare of light, the valley was as he had first seen it—a nauseous charnel place of bogs and brambles and mudflats littered with yellowed bones.

In the near distance, a haggard mob of natives cowered like gaping, witless caricatures of humanity, faces turned from the descending blaze of the parachute flare. There was no more music or laughter. The great moths fluttered in silent frenzy, stunned by the flood of light.

"So *that's it*," Farrell thought dully. "*They come out with the winter darkness to breed and lay their eggs, and they hold over men the same sort of compulsion that Terran wasps hold over their host tarantulas. But they're nocturnal. They lose their control in the light.*"

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Incredulously, he recalled the expectant euphoria that had blinded him, and he wondered sickly: "*Is that what the spider feels while it watches its grave being dug?*"

A second flare bloomed far up in the fog, outlining the criss-cross network of bridging in stark, alien clarity. A smooth minnow-shape dipped past and below it, weaving skilfully through the maze. The mechanical's voice box spoke again.

"Give us a guide beam, Xav. We're bringing the *Marco* down."

The ship settled a dozen yards away, its port open. Farrell, with Xavier at his heels, went inside hastily, not looking back.

Gibson crouched motionless over his control panel, too intent on his readings to look up. Beside him, Stryker said urgently: "Hang on. We've got to get up and set another flare, quickly."

The ship surged upward.

HOURS later, they watched the last of the flares glare below in a steaming geyser of mud and scum. The ship hovered motionless, its only sound a busy droning from the engine room where her mass-synthesizer discharged a deadly cloud of insecticide into the crater.

"There'll be some nasty coughing among the natives for a few days after this," Gibson said. "But it's better than being food for larvae . . . Reorientation will pull them out of that pesthole in a couple of months, and another decade will see them raising cattle and wheat again outside. The young adapt fast."

"The young, yes," Stryker agreed uncomfortably. "Personally, I'm getting too old and fat for this business."

He shuddered, his paunch quaking. Farrell guessed that he was thinking of what would have happened to them if Gibson had been as susceptible as they to the overpowering fascination of the moths. A few more chrysalids to open in the spring, an extra litter of bones to puzzle the next Reclamations crew . . .

"That should do it," Gibson said. He shut off the flow of insecticide and the mass-converter grew silent in the engine room below. "Exit another Hymenop experiment in bastard synecology."

"I can understand how they might find, or breed, a nocturnal moth with breeding-season control over human beings," Farrell said. "And how they'd balance the relationship to a time-cycle that kept the host species alive, yet never let it reach maturity. But what sort of principle would give an instinctive species compulsive control over an intelligent one, Gib? And what did the Bees

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get out of the arrangement in the first place?"

Gibson shrugged. "We'll understand the principle when—or if—we learn how the wasp holds its spider helpless. Until then, we can only guess. As for identifying the motive that prompted the Hymenops to set up such a balance, I doubt that we ever will. Could a termite understand why men build theaters?"

"There's a possible parallel in that," Stryker suggested. "Maybe this was the Hymenop idea of entertainment. They might have built the bridge as balconies, where they could see the show."

"It could have been a business venture," Farrell suggested. "Maybe they raised the moth larvae or pupae for the same reason we raise poultry. A sort of insectile chicken ranch."

"Or a kennel," Gibson said dryly. "Maybe they bred moths for pets, as we breed dogs."

Farrell grimaced sickly, revolted by the thought. "A pet farm? God, what a diet to feed them!"

XAVIER came up from the galley, carrying a tray with three steaming coffee-bulbs. Farrell, still pondering the problem of balance between dominant and dominated species, found himself wondering for the thousandth time what went on in the alert positronic brain behind the mechanical's featureless face.

"What do you think, Xav?" he demanded. "What sort of motive would you say prompted the Hymenops to set up such a balance?"

"*Evaluation of alien motivations, conversely,*" the mechanical said, finishing the Reclamations Handbook quotation which Stryker had begun much earlier, "*is essentially impossible because there can be no common ground of comprehension.*"

It centered the tray neatly on the charting table and stood back in polite but unmenial deference while they sucked at their coffee-bulbs.

"A greater mystery to me," Xavier went on, "is the congenital restlessness that drives men from their own comfortable worlds to such dangers as you have met with here. How can I understand the motivations of an alien people? I do not even understand those of the race that built me."

The three men looked at each other blankly, disconcerted by the ancient problem so unexpectedly posed.

It was Stryker who sheepishly answered it.

"That's nothing for you to worry about, Xav," he said wryly. "Neither do we."

—ROGER DEE

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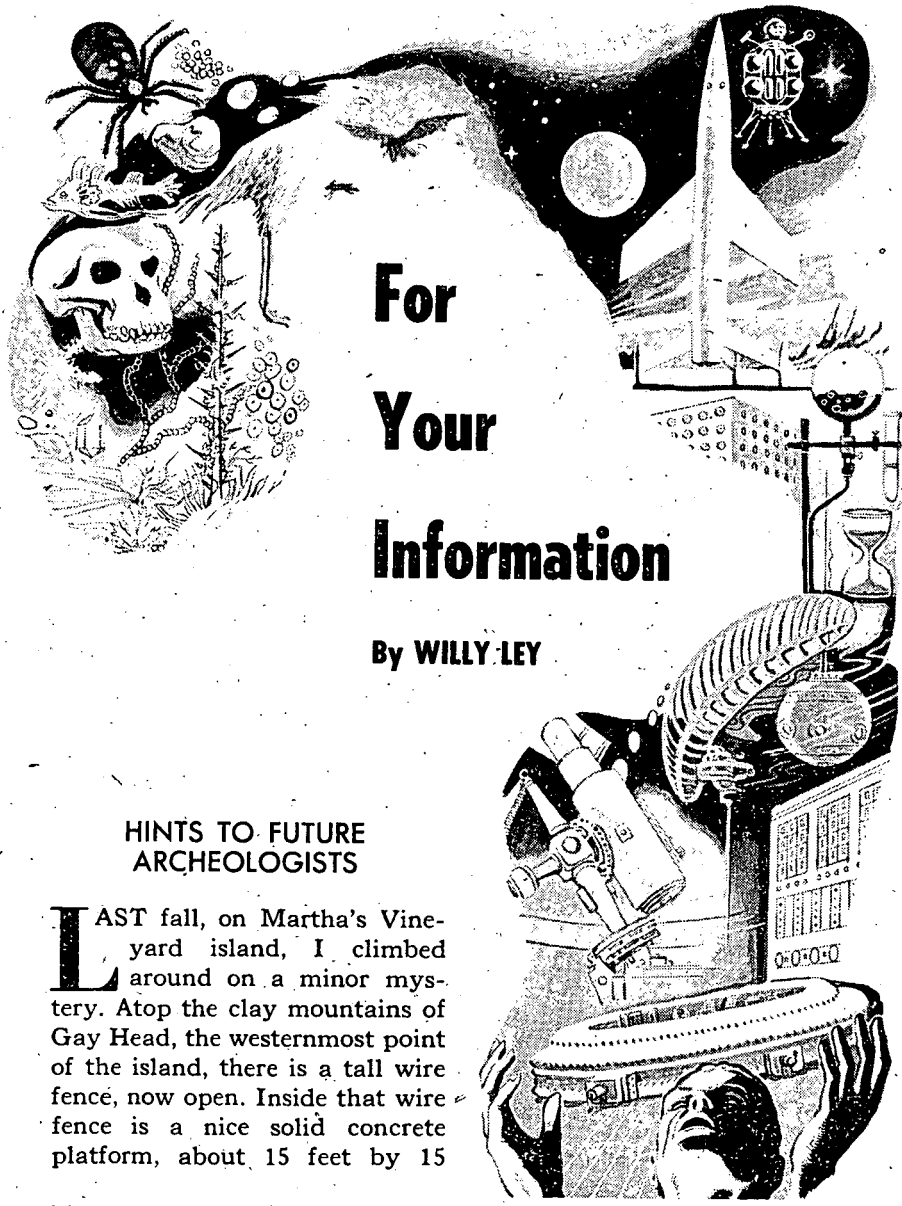

For Your Information

By WILLY LEY

HINTS TO FUTURE ARCHEOLOGISTS

LAST fall, on Martha's Vineyard island, I climbed around on a minor mystery. Atop the clay mountains of Gay Head, the westernmost point of the island, there is a tall wire fence, now open. Inside that wire fence is a nice solid concrete platform, about 15 feet by 15

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feet in size and a foot or so in thickness. Underneath, in the clay ground, a kind of basement has been dug with steel posts that carry the platform. The local guide tells tourists that this was built during the first World War with the greatest amount of secrecy possible. To this day, nobody knows what purpose it served or whether it was used at all.

While standing on the platform, I thought that when the date of construction eventually is forgotten, people will be likely to explain it as a launching platform for V-2 type rockets, for it certainly resembles one. And then my mind jumped to Sprague de Camp's favorite short lecture that answers the question "How do you science fiction writers get your ideas?" and I thought that this would be a nice puzzler for a planetographer from the Rigelian star system. Five minutes later, I reconsidered. You don't have to go out into space. Just let a few centuries elapse right here on Earth and archeologists of our own kind will come across some beautiful brain-twisters, puzzles they'll never be able to solve unless still-preserved records help them.

FOR example, archeologists digging in southern England will find iron spheres. First one or two, then—having brought magnetic detectors into play—six more here, three more there, a total of about two dozen. Being careful archeologists, they will notice at once that all these spheres form a straight line, disregarding trivial lateral displacements that obviously took place later.

Their spacing is another problem, however, for it does not seem to follow any pattern.

The archeologists will then remove the spheres to the laboratory, for measurement and testing.

In size, the iron spheres are all 35.6 inches in diameter, with very minor variations. But they differ in weight. Expressed in terms of the "old" English pound, they weigh 2365 lbs., 2400 lbs., 2500 lbs., and 2990 lbs. Since even the heaviest of these is too light for a solid cast iron sphere of 35.6 inches, they must be hollow. So a couple are sliced open with great care and under remote control.

Yes, they are hollow and each opened sphere contains a little less than 500 lbs. of a crumbling powdery substance. The stuff does not explode. It does not even ignite well. It merely smolders under a sufficiently hot flame.

Throwing a sample in a beaker of water, one man finds that it separates, much of it sinking to

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the bottom while the smaller portion floats. What sinks to the bottom looks like sand. Chemical analysis shows that it *is* sand. The stuff that floats shows the cellular structure of wood under the microscope and is subjected to age analysis by the carbon-14 method. Analysis says the trees were cut down in 1860 A. D., with a possible error of plus or minus 15 years.

But what *are* those things? The cannon balls used in the 19th Century, the archeologists know, rarely exceeded four inches in diameter and were solid iron. And, even accepting for a moment the preposterous theory that they were projectiles, they would have been filled with a mixture of charcoal, sulfur and saltpeter, not with sand and chips of wood (uncharred) about two millimeters long and a half millimeter in thickness.

Well, the big balls actually *were* projectiles.

The long line of about two dozen of them were the test rounds fired from a single weapon, one of two super-mortars which had originally been ordered by the British Ordnance Department for the pursuit of the Crimean War. That the balls were filled with 480 lbs. of sand and sawdust was merely a proving ground safety measure. The ordnance men were testing the guns, not the projectiles.

The large mortars were the invention of a Mr. Robert Mallet, who suggested that they be mounted on barges or rafts to bombard troops ashore. The nevelty was that the barrels were not cast, but consisted of a number of longitudinal bars, held together by rings and tightened by clamps and bolts.

The authorities to whom he submitted his plan did not think much of the idea, but Mr. Mallet somehow got the ear of Lord Palmerston, the First Minister of the Crown, and a tough letter written by Lord Palmerston on May 2nd, 1855, made the Lieutenant General of Ordnance take care of the matter personally.

REQUESTS for bids were sent out within 24 hours and, when a bid came in, it was accepted within 12 hours! Unfortunately the firm which had sent in the bid went bankrupt before the two mortars were finished and another firm had to take over. All this delayed the delivery period—instead of the ten weeks promised by the first firm, it took a total of 96 weeks. By then the war was over and the Chief of Ordnance asked for an accounting sheet. He did not like what he read.

The bid for the mortars had been 4000 pounds sterling for

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each, provided it weighed not more than 35 tons, with 140 pounds sterling for each additional ton. The two mortars weighed 40 tons apiece. The forty-odd projectiles cast by another firm cost 16 pounds sterling per ton. Two loading cranes cost 150 pounds sterling each. And the laying of just one platform for test firing was to cost 450 pounds sterling.

So it was decided to build only one platform and to test only one of the two mortars. The first test was made October 19, 1857, with a propelling charge of only ten pounds of coarse cannon powder. Range: 370 yards. The charge was doubled and the range increased to 900 yards. Round No. 7 with 70 lbs. of cannon powder carried to a distance of 2644 yards. Then something broke and had to be repaired. In December, 1857, there were more tests—one of them resulted in the first photograph of a projectile in flight—and something broke again. This went on until July, 1858, when a range of 2759 yards was reached and something else broke.

The new Chief of Ordnance, General Peel, refused to spend any more cash on this project—not a farthing more, he declared. (He did authorize an expenditure of 12 shillings and sixpence eleven years later, which was for guncotton to blast apart the piece.) As for the projectiles fired, Nos. 1, 4 and 15 were found. The engineers would have liked to dig the others up, too, but when General Peel learned that this would cost 22 pounds sterling apiece, he decided to leave them in the ground.

They are still there, at an estimated depth of 30 feet below the surface of the soil.

In the case of the big round bombs from the Mallet mortar, future archeologists might still puzzle it out — if they happen to know that the area was once an artillery proving ground. But one day they may come across several hundred yards of pipe, resting on the ocean bottom near the northern shore of Cuba. Everything about it will be puzzling, beginning with the question of what that length of pipe is doing in the ocean. This might be explained by saying that it may have been jettisoned by a freighter in distress or that it had been a tow cargo which broke loose. But for whatever reason it may have been lost, what was its intended purpose?

AFTER scraping off all the marine life which has assembled on the relic inside and out, the archeologists will find that it was not only long but also big, about five feet in diameter

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on the inside. The material is clearly sheet steel, but of a wall thickness that is ridiculously small compared to its size. That pipe could not have carried any pressure on the inside and it could not have withstood any pressure from the outside. But it must have been meant to carry something, and presumably something hot, because it was wrapped in heat-insulating materials.

The explanation is that this pipe once was a part of an interesting experiment conducted (and paid for) by the French physicist and inventor Georg Claude in collaboration with the engineer Paul Boucherot.

It all began some time back—to be precise, with an article in the September 17, 1881, issue of the French scientific magazine *Revue scientifique*. The article was written by Professor Jacques Arsène d'Arsonval, who later acquired fame as an electrical researcher. But this early work of his did not concern electricity. Rather, it dealt with a novel form of "steam" engine.

Professor d'Arsonval first stated for the benefit of those readers who were not engineers that any engine works on a difference in temperature levels. The steam in a boiler is "hot." The outside air, by comparison, is "cold." But it matters little what the two temperatures involved are in degrees of centigrade or Fahrenheit. What is important is that there is a difference. Nor is it necessary that this difference be as great as it usually is in a steam engine.

Take the Warm Spring of Grenelle, for example, he continued. Its waters have a temperature of 86° Fahrenheit (I am converting; actually he used centigrade, of course) and the water of a river nearby has usually a temperature of 60° Fahrenheit, often less. So there is a difference of at least 26° Fahrenheit, often more. If one immersed a boiler in the Spring of Grenelle and cooled the condenser in the river, once would have 26° Fahrenheit to work on. This wouldn't do anything if you had water in the boiler, but if you filled the boiler with sulfur dioxide, you would obtain a *pressure* difference of about 20 lbs. per square inch and this would be enough to do useful work.

Nor does one need a warm spring for this scheme, d'Arsonval added. The boiler could be in a normal "cold" river if the condenser is packed in ice. Or the boiler could be at the surface in a warm ocean and the condenser at the bottom of the same ocean, for the bottom water of all oceans has a temperature of 39-40° Fahrenheit while the surface, in the tropics, is warmed to 75-80° F.

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The readers of the *Revue scientifique* probably thought this an amusing idea. They most likely checked the figures and found them correct, but they saw no reason to go on from there. Steam engines worked and one day, maybe, those who were after engines running on coal gas might succeed, too.

AT a somewhat later date, however, several engineers tried their slide rules on the problem of the extraction of energy from small temperature level differences. The first after d'Arsonval was the American William Campbell in 1913, then the two Italians Boggi and Dornig and, in 1925, the German Dr. E. Bräuer. None of them was in a position to build expensive machinery. George Claude, inventor of the neon tube and successful pioneer in other fields, was in a more favored situation.

Claude had evolved the same chain of reasoning as d'Arsonval, but doubted whether a special working fluid was really needed. Water will boil at 70° Fahrenheit, provided the atmospheric pressure is lowered.

To test his contention, Claude used two large narrow-necked glass jugs. Jug No. 1 was filled to about one-quarter of its capacity with water at a temperature of 82° Fahrenheit, the temperature of surface water in a tropical sea. From the neck of this jug, a pipe led to a small turbine in the second jug. The turbine was coupled with a tiny generator and from there wires led to three flashlight bulbs. The bottom of the second jug was covered by a layer of crushed ice, with the neck connected to an air pump. The air pump lowered the pressure in both jugs to three per cent of normal atmospheric pressure, when the valve was closed.

By that time, the warm water in jug No. 1 was boiling furiously, the turbine spun and the three bulbs burned brightly. The spent steam condensed on the crushed ice.

Heartened by this success, Paul Boucherot, the engineer of the team, spent some of Claude's money on a 50 KW generator, built a steam turbine and the necessary auxiliary equipment and assembled the whole near some blast furnaces in Belgium. The cooling water of the blast furnaces was the heat source. The river Meuse supplied the cold water for the condenser. The temperature difference was 36° Fahrenheit.

The machinery ran for the first time on April 29, 1928, and measurements proved that the auxiliary equipment (especially the air pump) used only one-quarter of the power generated.

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THE next step was to run this with ocean water. After a preliminary search, the Bay of Matanzas, about 50 miles to the east of Havana, was picked.

There had to be three pipes. One to take in warm surface water. One to discharge the used water. And one was to bring cold water from the bottom to the surface.

The last pipe was the big problem. It had to be insulated so that the cold water would not absorb heat on the way up. And it had to be quite long to reach down to cold water—1.2 miles, to be exact. Since Claude wanted to use this most expensive item of the whole in a later and bigger unit, he made it quite large, five feet in diameter, although a one-foot pipe might have been large enough for the unit that had been brought from Belgium.

It was then that a streak of bad luck began. The first long pipe was lost because the ropes broke and it sank to a depth beyond accessibility by divers. The second kinked and developed a leak that could not be repaired. The third was put into place in September, 1930, but it was too short. The "cold" water came in at 58° Fahrenheit, so that the temperature difference which could and should have been 50° Fahrenheit was a mere 24° F. The equipment still ran, but it produced only a little over 40 per cent of the rated output.

Claude had to buy power from the local power company to run the auxiliary equipment!

And that is how a large and strange pipe got to be on the bottom of the ocean near the shore of Cuba.

The rest of the story does not take long to tell. Claude was advised by Dr. Bräuer and others that it had been wrong to work with low-pressure water vapor and that he should adopt d'Arsonval's proposal or use ammonia as a working fluid. But Claude blamed everything on the location on the shore and put his next set of machinery on a steamer, the 10,000 ton *Tunisie*. Again it worked badly and in the end Claude, in disgust, scuttled his equipment.

I can't report the "consensus of experts" because only a small number of men have thought about this problem to any extent. But the few whose opinion I know do not believe that Claude's failure proves that it cannot be done. They think—and said—it merely proves that it cannot be done with Claude's equipment.

ANY QUESTIONS?

A car is traveling along a road at about 30 mph. A fly which has been sitting on a back seat rises,

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hovers in the air for a moment, flies toward the front of the car and lands on the dashboard. The fly, while hovering, was completely removed from the car, yet was not flying at 30 mph. Which scientific rule or law covers this situation?

John Lanctot
159 Park St.
Burlington, Vt.

This is an old one and of the same kind as the following: "A fly in an empty bottle is perfectly balanced on a jeweler's scale as long as it is sitting down inside the bottle. What happens if the fly starts flying inside the bottle?" The answer is nothing for the weight of the fly stills rests on the air inside the bottle.

Similarly, in the moving car —provided it is a closed car— it is moving along at the rate of 30 mph. While the "air speed" of the fly in flying from the back seat to the dashboard may be just about three mph, its "ground speed" is 33 mph.

Could melting polar ice cause the ocean to rise enough to endanger coastal areas?

Tom Treadwell
225N. 12th
Springfield, Oregon

The answer to this question depends almost entirely on the circumstances you have in mind. I think someone calculated that if all the polar ice on both poles were melted, the oceans would rise by about 20 feet. This, of course, would endanger a number of coastal areas. But the assumptions of this calculation are that (A) *all* the ice is melted and (B) that it happens suddenly.

In reality, neither the one nor the other could take place. Nor would all the water go into the oceans directly. Much of it would enter the atmosphere and condense on high mountain chains so that the result would be longer and thicker glaciers. wherever glaciers form, the inland lakes would increase in depth and size, the underground water table would be raised, and so forth.

The overall result of a gradual melting of the polar caps would likely be an increase of the depth of the oceans of only a few feet, which would be felt in a very few places.

The only portion of the spectrum visible to the human eye is the portion beginning with red and ending with violet. But it seems conceited to me to believe that these are the only colors which exist in Nature. Are there any substances colored infra-red or ultra-violet, or would it be possible to manufacture infra-red

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or ultra-violet pigments? And how would such pigments appear to the naked eye?

John Siegel
21-10, 202nd St.
Bayside 60, N. Y.

To avoid the semantic confusion which is imbedded in this question, let's begin at the beginning. Our atmosphere is especially transparent to those rays which lie between what we call red and violet. As living beings evolved, their eyes logically acquired sensitivity to the rays which were around in massive doses, though these eyes did not necessarily distinguish color. (A surprising number of highly evolved mammals are totally color blind.) As for infrared, we are sensitive to these rays, but our sensory organs interpret them as heat.

In short, then, "colors" are what we see and distinguish as colors. What is beyond the colored portion of the spectrum is still radiation that might have optical effects, like ultraviolet on a photographic plate, but only in terms of light and dark, not at all in terms of color.

Would you please explain how the gravitational pull of the Moon can cause tides on both sides of the Earth at the same time? And does the Sun cause any tides of the Earth's oceans or is it too far away?

James L. Coleman
538 St. John's Rd.
Toronto 9, Ont., Canada

The tide-raising action of the Moon is best understood if we first imagine a line drawn from the center of the Moon to the center of the Earth and then continued through the Earth.

The ocean directly under the Moon around the line is somewhat deformed, rising in the Moon's direction by about one yard. (The much higher tides observed near the shore are due to a "funneling" action of the shoreline, especially in slowly constricting spaces like the Bay of Fundy.) Then the Earth as a whole yields somewhat to the Moon's attraction, so that the ocean directly away from the Moon, where the center-connecting line touches the surface again, is "left behind," forming a second deformation that is not quite as high as the one on the Moonward side.

Because the Earth turns much more rapidly than the Moon travels around the Earth, these two bulges seem to travel around the Earth. They do not actually travel; it is simply that the ocean near that center-to-center line is deformed.

The tide-raising power of the

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Sun is much less than that of the Moon, but it is measurable. When the solar bulges coincide with the lunar bulges (at "new" Moon and at full Moon), the tides are higher than normal. When a lunar bulge hits a solar "low," the tides are less than normal.

Why is it that no meteorites hit the Earth now, or hardly ever in the present time?

John Guild
2809 Burdick Rd.
Oak Bay, Victoria, B.C.

The Earth is being hit steadily by a hail of meteorites, but the vast majority of them are about the size of grains of very fine sand and burn away before they reach the surface. Really big meteorites, weighing a ton or more, are great rarities and seem to have been rare in the past, too. In the present century, there have been just two known large meteorites. Both of them struck in Siberia, the last one in 1947. But three-quarters of the Earth's surface is water and there are huge uninhabited land areas from which we wouldn't get any reports. The odds, as you can see, are against meteorite strikes in civilized territory, in case anybody happens to be worrying about it.

—WILLY LEY

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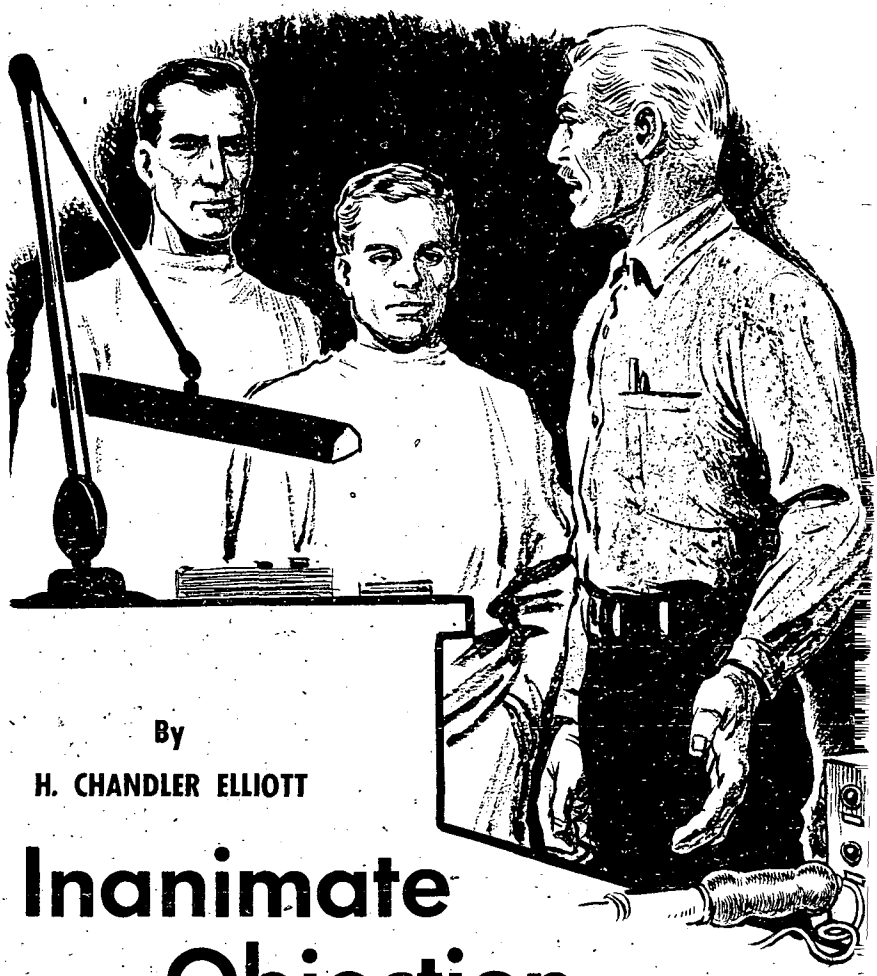

By

H. CHANDLER ELLIOTT

Inanimate Objection

Attacking someone's systematized delusions can be a dangerous thing. You're liable to find that he is not as deluded as you are!

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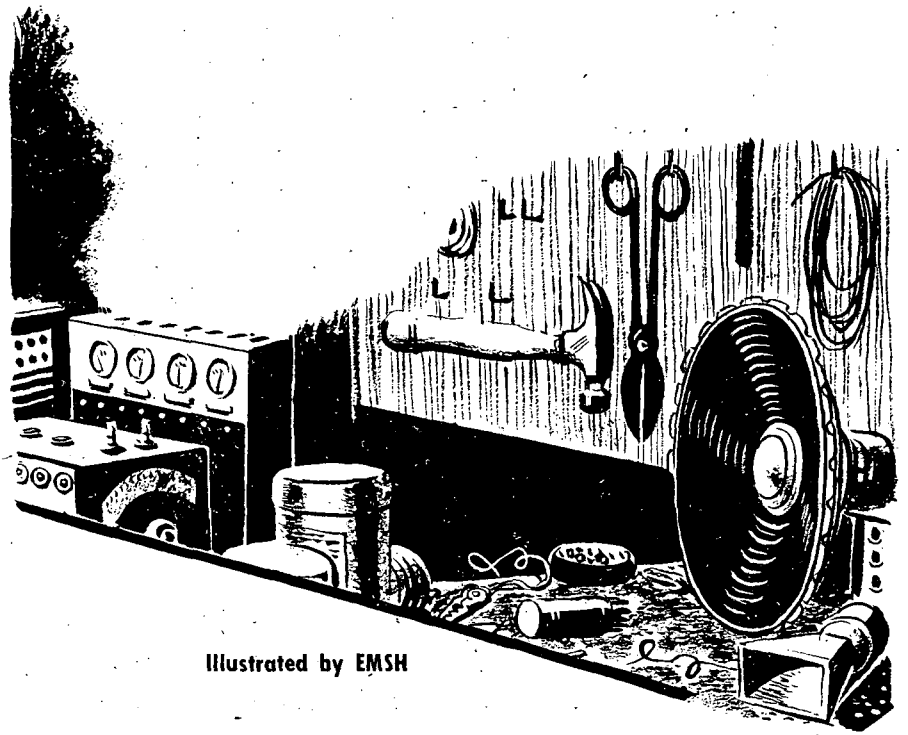
DR. CARL WAHL (intern) skimmed over the highlights of the Worksheet, Mental Status, as it strove presumptuously to fix the outlines of a human personality — and an off-beat one at that:

PATIENT'S NAME: (Maj.) Angus G. Burnside. AGE: 57. DOCTOR: Wm. Svindorff, Dr. Matthew Loftus in attendance.

GENERAL HISTORY: Army Engineers, specialist electric communications. Retired small Catskill estate 1949. No record of major trauma or disease. KIN: Married, Ruth Elvira, nee Barker, aged 35, she says. Relationship amicable but somewhat distant.

Attitude: Quiet, cooperative. Personal habits meticulous. Permitted unlimited access to books and electronic materials. Coherent outside limits of his mania. EMOTIONAL REACTION, AFFECT: Calm, amused at his own situation. NATURE OF ABERRATION: Believes inanimate objects display active hostility. This is not directed at himself personally. In fact, he believes he can circumvent it more readily than most, but expresses concern for safety of the human race. Discusses this belief with scholarship



Illustrated by EMSH

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and detachment. EXAMPLES: Said to nurse (Miss Clements): "Your apron-bow is waiting to pick something off that tray." Said to me (Loftus): "I'd fix that loose heel if I were you. If it hasn't thrown you yet, it's just waiting for an opportunity to really break your neck."

"Well, hell!" said Dr. Carl Wahl. "That's just a picturesque way of expressing commonplace facts. He sees something that's liable to cause an accident, and personifies it. Why put a mild eccentric like that in here, when we can't accommodate urgent cases?"

Dr. Matthew Loftus (resident) grimaced: "Since you ask, I'll agree it stinks. Of course, those excerpts don't give you any real idea. He's as psychotic as a jaybird, no doubt at all. He conducts himself entirely according to this fixation. And he's got it all worked out in theory, too; damnedest stuff you ever heard, plausible as only a complete psychotic can be—half convinces you, till you get away from his spell and have a chance to think. But I agree . . . he certainly shouldn't be here."

Wahl put the Worksheet on Matt Loftus's desk, looking interested. "You *would* draw the only ripsnorter with big ideas in this grab-bag of catatonics and dements."

"Not to mention dipsos and plain stumblebums," Matt Loftus grinned. "And that old lady who makes immoral paper dolls." He looked at the sheet almost fondly. "A little old-fashioned, poetic madness *is* rather refreshing, isn't it? And Angus Burnside is a gentleman and scholar of some old school, and a most engaging conversationalist. I frequent his lair considerably more than is strictly required. Tell you what, Carl . . . I'll take you on as consultant, if you're interested. You could get next to him on music; he's got a terrific audio system up there, and he actually plays it as much as he tinkers with it. Best company in the institute."

"That," said Carl Wahl, "is a deal."

THAT afternoon, after a non-institutional knock and a polite summons from within, the two men entered the Major's room. Large by local standards, it could have been a good hotel-room-with-bath, except for the barred windows and general starkness. The chintzy curtains, cheery rugs, and optimistic pictures usually found in high-class mental wards were absent, replaced with dialed cabinets, a long shelf of records and tape spools, and an electrician's workbench of impressive resources.

The occupant, rising from the bench to face his visitors, would have dominated a much more distracting environment—say, an

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amphibious retreat under enemy fire. He was a lean, brown man; his hair was silver but thick; his white mustache was clipped with extreme precision. His gray eyes were merry and kind, however: in that amphibious debacle, he would be the type to rescue men physically by diving in, or mentally with acrid jests. Carl's practiced glance could note none of the little tics or rigidities that often betray underlying dislocation of nerves or mind.

The Major immediately put everybody on terms of informal equality by displaying the wireless relay he was arranging between his phonograph amplifier and speaker. Then, with the smartness of a precision-drill squad, he clicked back into racks and drawers the few tools and bits of material in use, and turned to Carl with disconcerting candor: "I suppose you want to hear my theory—or mania? Fine! Make yourselves comfortable."

Matt draped himself on the bed and Carl took an armchair. The two were a complete contrast: Matt, behind a youthful face and mild voice, kept in ambush a mind as incisive as an electric scalpel; Carl, raw-boned and lank-haired, was a very reliable citizen, but he harbored a quiet mysticism that was often invaluable in establishing rapport with the mentally unconventional.

"I'll ask you," the Major began, "to consider my thesis as dispassionately as our relative positions will allow. For a start, perhaps you'll admit that any notion, however apparently fantastic, that has been held by many ages and cultures is worth scientific investigation, if only to explain it away."

They nodded.

"Good," said the Major. "Now, few notions have been so universally held as the one I shall discuss: that what we call inanimate objects have a will of their own. The ancients endowed them with spirits—lares, oreads and so on. Medieval alchemists described an elaborate, if largely arbitrary, system of sympathies and antipathies—*not* personification, but something far subtler. Modern science simply shrugs: fantasies of dawning reason. An opinion without proof, I submit. In the last war our fliers, the flower of the mechanical age, devised the Gremlins—whole fun and half earnest—for they sensed something more than a chance mechanical failure . . . some Thing malicious and aggressive."

CARL was attentively analyzing manner as well as matter: The Major's logic was certainly off the gold standard—the case built on random gleanings, the disregard for alternative possibili-

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ties. Yet certain psychotic qualities were lacking: the grandiose seriousness, the touchiness, the air of knock-down argument. And, an inner mentor reminded, the ability to select significant detail was often the trademark of genius: "great wits are oft to madness near allied . . ."

"Of course," the Major continued, "the idea flouts sacred axioms. But, after all . . . sacred? Science is study of *evidence,* not recitation of a creed. And aren't the axioms being badly strained? '*If* you knew all the physical factors, you could explain everything.' Safe enough, since you never will know them. But your axioms work to a high approximation in certain carefully selected and managed cases, so you reject all other explanations for everything, in the name of a spurious unity."

So he *did* consider alternatives, Carl thought. Aloud, he asked, "What evidence exists for any other explanations?"

"Ha! That's exactly my 'mania.' By the theory of probability, you get a straight flush in every-so-many poker hands. But what if straight flushes crop up all over?"

Matt objected: "We've already discussed how easily you can prove dreams are prophetic if you record the ones that turn out and disregard the rest, and so on."

"True enough. And you can prove tigers' claws or 17-desoxybethylene are miracle-drugs, *if* you stress the cures and explain away the regrettable fatalities."

"Touché," said Matt. "Fire ahead."

"Also, I've already admitted that my weak point *is* getting things on a statistical basis. I've been collecting data for years—" he gestured toward a row of fat notebooks beside his records—"but things like poker hands, which you can tabulate easily, are obviously least likely to illustrate my point—they're too simple, mechanically, to enjoy much freedom of action. Besides . . ." He smiled faintly.

"Go on," said Matt. "You think this is a weak link . . . sounds irrational. Seriously, it impressed me as genuine observation."

"Glad to know it, Doctor. Well, you know that the presence of an observer changes conditions so you can't know what would have happened with no observer. That won't perceptibly affect motion of a falling body, or other such elementary cases. But in complex, versatile systems, I believe the effect increases enormously. I believe physical processes *know* they're being observed and evade analysis—I'm using 'know' as engineers do when they use the expression 'How does the valve

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know force is applied?' "

Carl was drawn off guard: "There's a traffic light at Tenth and Capitol I swear goes red just as I reach it—oh, four times in five. I tried keeping count once, and I'm certain the frequency changed while I was doing it."

"More likely your car than the light. Anyway, there you are. If you can't get statistics, you have to fall back on intuition, and that isn't science."

"Well, then," Carl made amends to his professional conscience, "there isn't much point bothering with it, is there?"

"Sometimes I fear not. But if enough people were thinking along those lines, someone might hit on a way to fool the resistance. Anyway, amuse yourself applying my theory and see how it fits." The Major dismissed the topic and talked electronics for the rest of the visit.

"WELL," Matt grinned afterward, "isn't that a honey of a mania? His science is top-drawer stuff, too. Tell you what: I'll lay you a dollar even that you'll be taking him 'whole fun and half earnest,' as he puts it, by Christmas. I know you won't cheat for that little: in fact, knowing you, it'll make you confess if you weaken."

Carl laughed and took him up. Which meant that he had to take the Major's suggestion at least in half earnest. But he needed amusement. In addition to a merciless load of work at an institute half destaffed by flu, he had worries: his wife Clare, of whom he was somewhat fond, had the flu too, followed by pneumonia and complicated by allergic reaction to the antibiotics applied. Having had a fortnight off during the emergency, he could not decently get down to their little apartment more than once or twice in the next fortnight, and he was a type who worried quietly but effectively. He found Major Burnside's fantasy a distraction, and even hoped it would later appeal to Clare's lively sense of humor.

So he collected instances: The dollar pencil that dropped on its rubber and vaulted into the plumbless depths of a hot-air register; the tiny rip in the sleeve of his white jacket that snagged on the tap of a coffee-urn, causing him to slop a cup of scalding coffee over trousers and ankle; the page of vital report that blew off his worktable and slid craftily behind a newspaper in the wastebasket; and a dozen more commonplace acts of malice by familiar objects.

He had to convince himself that the laws of chance adequately covered each incident; but also he had to grapple with underly-

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ing implications. So Sunday afternoon he seized a breathing-space to go up, armed with a clearance from Matt, to reason with the Major.

"Look here, sir," he began. "Gathering data is the first step, but you've got to have some general theory. Ruling out literal Gremlins, why *should* objects be actively hostile?"

The Major looked up from a soldering job, with a twinkle: "If I give you a theory, will you be the least bit more persuaded? All right: Why do *we* like organization, control, applied power?"

Carl reflected: "Oh . . . I suppose it's the nature of life to extend itself by organization of the environment—tools and so on."

"Excellent. Well, the mass of the Universe behaves in exactly the opposite way—*dis*organizing, devolving. Any reason why this much vaster process shouldn't have—well, a sort of counter-life? Well, then, to *it*, our organizing activities would be equivalent to fires, contrary winds, rust. Up to a few thousand years ago, the effects of life were trivial—a little photosynthesis and burrow-digging that mattered no more to counter-life than geological erosion matters to us. But now Man is organizing matter and energy on an expanding scale—a regular epidemic of natural disasters to counter-life. So, of course, it resists and fights back."

"Hold on!" Carl protested. "After all, our activities cause increased breakdown of material, on the whole. That should be gratifying to it, not disconcerting."

"Yes—but we organize *some* matter very highly, and might eventually reverse the whole trend. Anyway, the further we go, the more opposition we generate."

"Pretty trivial opposition. Guerilla warfare."

The Major smiled. "Napoleon and Hitler were softened up for the real counter-offensive by guerilla warfare. How much of *your* life does it waste, for example?"

CARL thought that over. That morning, he had lost half an hour over a broken shoelace, a shaving-cream cap that escaped down the sink, a shirt-collar loop that refused to hitch over its button, and a handful of money that scattered jubilantly when his trouser pocket snared a finger. He had accordingly breakfasted on peanuts and, on ward rounds, had covered himself with mediocrity in the eyes of Dr. Svindorff.

He changed his point of attack—or perhaps fell back on his own second line?

"But how does it work?" he asked. "I mean, we know the laws

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of mechanics, and they don't leave scope for free action."

"Oh, don't they? *We* operate by chemistry, and yet we feel we have plenty of freedom. Simple mechanical systems made of docile materials don't have much freedom, true. But we can't extrapolate that fact to cover all cases."

"Docile materials?"

"Metals, for example. Passive, like plant life. And we cast them in geometric forms. And even then they trick us. We get endless amusement out of games played with the simplest geometric form of all, the sphere, from billiards to baseball. What do we know of possibilities in really subtle systems of matter—fabrics, paper, rubber, ready to rebound from the almost organic forms forced on them?"

"Hm! Aren't those organic materials?"

"*Ex*organic. What populations are more fanatical for liberty than those that have just been liberated from obnoxious control? And note this: We organize matter only for special purposes; matter tries to waste our energies out of systematic hostility. The aspirin tablet that eludes you and wastes two minutes of your time has won a victory in a battle we're not even consciously fighting yet."

Carl rationed himself one last question—the topper: "Do you consider that individual objects have personality—that soldering iron, for instance?"

"I have an impression they enjoy a sort of merged or cooperative mentality—but certain forms have more or less individuality too. This iron—" He reached for it back-handed; his cuff touched a kink in the cord and the iron swiveled in its cradle to graze his wrist. He snatched his hand away, sending the iron clattering across the bench; but he caught it neatly before it had singed the wood, and set it in the cradle as if he were handling a cobra. "Yes! That soldering iron—or its cord—has plenty of personality; one of the most treacherous tools I've ever owned. And you'll notice how they use our very actions to thwart us, just as we use mechanical laws to make them act constructively. Of course, clumsiness gives them opportunity. I should have switched that off."

Carl attributed the little accident to autosuggestion, a Freudian slip, and went away shaking his head. He had never met so well-integrated a delusion. By heaven, he hadn't found the flaw yet! He hoped it would amuse Clare—she was often mighty sharp at analyzing such things.

THE following evening was his night off. He entered the apartment house with two large

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shopping bags of staples and Clare's favorite delicacies, to find that he would have to heft them up six flights, the elevator being out of order.

He set them, panting, on the floor of the seventh flight while he opened the door. The door-check resisted sullenly, and he had to put his heel in the opening while he scooped up the groceries.

As he turned, something jerked violently at the small of his back —the belt of his trenchcoat somehow, impossibly, had snubbed over the doorknob.

Surprise, as much as the jerk, unbalanced him. His other heel slipped on the waxed linoleum of the landing. He lurched against the door, which now yielded like a swooning maiden, and he dove into the living room, frantically trying to save the toppling bags. The belt let go with the timing of a trained athlete, and everything went flying. He snatched at the top of one bag, and the sturdy paper ripped like tissue. With his other hand he came down solidly on a carton of cream that had rolled to the precise spot requisite, like an outfielder intercepting a fly.

Clare, in her bathrobe, came scurrying to the bedroom door, to find him arising from among the debris. The door had closed decisively on a bag of eggs; a small sack of flour, disgorging at one

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corner, smirked raffishly against a sofa-leg.

"Gracious!" Clare said, between mirth and peevishness. "*Must* you be clumsy?"

Through Carl's mind, before he realized it, flashed, *Well, they're not going to make trouble between me and Clare!* And he gave the soft answer that turneth away wrath.

After supper, he tried to turn the episode to account by using it to introduce the Major's fantasy.

At the end, Clare said languidly, "Well, anyone who ever kept house wouldn't think he was so crazy!"

They spent the next hour swap-

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ping instances: the row of books that always toppled the way you didn't want them; the garment that slid silkily to the floor if one arm hung over an edge; the drawerful of articles that restacked themselves to wedge it shut; the ball of paper that avoided the gaping waste-basket and dove easily into the narrow cranny behind; the balcony door that normally refused to latch and banged in every breeze, but that had swung shut and smartly locked her out; and so on.

It was fun and did amuse Clare; but afterward he wondered if he should have put such fantastic ideas into her still feverish mind. Also, he worried about having humored the Major quite so far; it was really very unprofessional!

Next day, however, Matt eased the latter burden considerably by saying, "Dr. Svindorff is working on the Major's case—at my instigation. We can't prove that Ruth Elvira wants to enjoy his worldly goods in his absence; but there's no more reason to keep him here than a million other harmless cranks. Let him exercise his persuasive powers on the public along with Flat-Earthers, telekineticists, and prophets of Judgment Day come Jan. 19 . . . though, personally, I'll be sorry to lose him. I find him a diversion."

CARL felt the same. Candidly, he was itching to lick the Major's theory, over and above liking the man. But the odd hours they spent with the Major in his ward-cell-laboratory were devoted to mere yarns:

"—The wind snagged his parka on this one stub of branch, and there he was haltered over a five-hundred-foot drop, with the blizzard settling down . . . The jeep door knocked his glasses onto the one bit of rock within yards—thirty miles from town, dozens of hairpin bends, and the hills full of Huks—"

Amusing, but . . . against violent backgrounds of far outposts, violent accidents seemed natural enough; while by contrast, the freaks of civilized life grew pale and trifling. The magnificent phantasmagoria seemed to be sinking in a swamp of believe-it-or-not curiosities.

Half wishing to rescue things from anticlimax, Carl finally demanded, "You called all this just so much guerilla action. What shape would the real offensive take?"

The Major racked his tools and turned, as if the matter demanded his full attention: "Isn't it obvious? When we think of atomic war, we're afraid of the blast and fires and secondary radiation. But, to my mind, the big danger comes *afterward* . . . Ever

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drive down the Hudson, past those endless cliffs of apartment blocks, and wonder what would happen if a few power lines and water mains were cut, with no repair in sight? Lord! Those millions would be strangled, thrown back on techniques they'd utterly forgotten, pitted against materials that had learned to — defend themselves."

"Yes," Carl said slowly, "that would be an opportunity."

The Major sat down and clasped his hands over a knee.

"Look, Doctor, this may sound fantastic, but I'm mad anyway according to you. It's calculated that there must be millions of habitable planets, of which many have had ample time to develop space travel. Yet we've never had a certified visitor. Why?"

"I've heard it discussed. We're just a minor unit on the outskirts, for one thing."

"Quite true," the Major nodded. "Yet, if there were no more than a few hundred exploring races, surely *one* would have gotten around to us. Isn't it just possible that something deadlocks all life at a certain stage — some universal feed-back mechanism? And, on my theory, you can see what it would be — progress piling up resistance from counter-life. Past a crucial point, you might tip the balance in favor of life — but we're not nearly so close to that stage yet as we are to a blow-up. One slip, and we're done."

"Well, wouldn't thinkers on other worlds have seen the danger, if it's real?"

"Oh, I'm not so conceited — or mad — as to suppose I'm the only mind in the Universe to notice the obvious. But one is likely to see it too late, or not be able to persuade his contemporaries. *I'm* not making much headway, am I?"

Carl departed considerably relieved. You might come to take Gremlins half seriously, as personifying an active principle behind freak accidents; but as a cosmic threat engulfing the world and myriads of populated planets, they were merely silly. Carl suddenly felt himself back in daylight, free of the insidious suspicion that after all there might be something in what the old boy said. He knew once more that mechanics explained all accidents, if you only had time and patience to analyze them.

He said as much to Matt in the cafeteria.

"So I lose my bet, do I?" Matt smiled wistfully: "Well, the bet's off anyway . . . Dr. Svindorff says that Angus G. will be leaving before Christmas. But I thought you *were* drifting toward his siren song. Weren't you, honestly?"

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"Out of idle amusement. It's lost its fascination."

THAT afternoon, a phone call from Clare wiped out all other concerns. Clare had been out the day before, and gotten caught in the rain—now she had a misery and a temperature of 102. Carl felt a nasty qualm of apprehension; even a poor psychiatrist knew that in these cases the real danger was in relapse. He mortgaged his free time for the month ahead, and got the evening off.

He arrived at the apartment to find Clare in bed with their electric blanket huddled around her, not even trying to read. She greeted him with an anxiety that showed she too knew about relapses: "Do you think I'm going to be *very* sick?"

"Not if we keep you warm and quiet." He fixed the best light snacks he knew and fed her by hand.

At the end, she suddenly asked, "How's that old man with the theory about objects?" and hastened on, not waiting for a reply, "He's perfectly right."

She looked about fourteen, and valuable, bundled up with her brindled hair loose and her face worried. Carl scored himself for having filled her head with nonsense; though, of course, her fever would just have fastened on something else.

He jollied her seriously: "Well, I think bacteria are more dangerous than objects, in your case."

"*These* bacteria wouldn't have had a chance at me," she said firmly, "without some mighty funny coincidences. I got wet because I dropped my last carfare money, and it rolled like mad, and when it came to a crack, I'll swear it just swiveled and eased itself in. And I wouldn't have dropped it if my finger hadn't been hurt from when the window-cord broke and the window came down on my hand. And I wouldn't have gotten so wet if I'd had my slicker — but you remember how that went all funny when that bottle of cleaner on the shelf came uncorked and spilled over it."

Carl sighed. "You wouldn't have gotten wet at all if you hadn't tried to be noble and get back into harness before you were ready. Now, take this, and you'll sleep ten hours and wake up feeling fine."

But the last thing she said as she drowsed off was, "Shouldn've given'm chance. They know when you can't fight'm, 'n they pile on you."

He pulled the sofa to the bedroom door, so he could hear the least murmur, made himself a bed and turned in. He knew he was exhausted, and was deter-

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mined to avoid being a soft target for either germs or Gremlins by getting overfatigued . . .

He woke in the dead of night, with an extra-sensory perception of something wrong. He rolled to his elbow. The air was abnormally chilly, even for a low-cost apartment in December.

Clare stirred, and he called softly, "You all right?"

She mumbled feverishly, "No. I'm coooold."

HIS hand found the floor-lamp without actually knocking it over. Naturally, the switch was in the one position where he had to flounder to reach it, and when it did click, nothing happened.

Oh, fine, he thought. Electricity's off. Furnace controls dead!

He strode over to the bed. The electric blanket, of course, was a mere flimsy fabric. He patted Clare's hunched shoulder. "I'll get another blanket. Where's the flash?"

"On the table," she wheezed, and groped on the far side of the bed. There was a muffled bump, and she lamented weakly, "I had it and it just knocked against something and flipped out of my fingers."

"Don't look for it," he said. "Keep wrapped up. I can find my way in the dark." No use wasting precious minutes, he thought, blundering around looking for the flash, while it, neatly ensconced in some improbable nook, gloated just out of his reach. He started around the foot of the bed toward the bathroom door . . .

Something lashed out of the dark and swathed itself around his ankles. He stumbled disastrously, his outstretched hand plunging through air where wall should have been. His temple and cheek-bone jarred dazingly against a door frame. He saved himself from falling, but felt as if he had been battle-axed.

Clare's voice came hoarse and scared: "What happened? Are you hurt?"

He kept his tone cheerful, if shaky: "Just tripped over the bedspread turned back on the floor here. I'll throw it over you till I get the blanket."

Easier said than done. The topologists' puzzle of the inner tube that can't be turned inside-out through a hole in the side, though infinitely elastic, seemed elementary compared with flattening that eight-by-six rectangle of fluffy chenille. In the end, he gave up trying to do a perfect job, and bundled it over the shivering girl any old way, so he could be free to get that blanket.

The bathroom was utterly black; he could see only the dial of his wristwatch moving. With a sudden giddy feeling that the

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solid fixtures had shifted, he picked his way from sink to tub and along to the linen-closet over the tub's end. His exploring fingers felt painted wood and brass knob, cold and hostile. He opened the door. Folded sheets and shaggy towels seemed somehow a little friendlier. Sanity began to steal back as he carefully disengaged a blanket, giving it no opportunity to emulate the unruliness of the bedspread. As it came into his arms, a compact, well-folded mass, he let out a breath he had not known he was holding . . .

Something hit the bottom of the bathtub with an ear-stunning smash — a big bottle of some kind that had bided its time up there.

Oh, well — that particular mess could wait till morning, safely localized inside the tub. He edged back toward the door, calling, "Okay, honey, just a bottle. Be right with you." And he felt something hard under his foot, and then a sharp sting.

His rational brain began parroting, ". . . The first impression is of contact, carried by fast, Group A fibers, followed by one of pain, carried by slow, Group C fibers. Pain is of two types: first pain, bright, stinging, well localized . . ."

But a deeper level of his mind cut in with, "How did that hunk of glass know exactly where I was going to put my foot?"

HE got the blanket around Clare, angrily unconcerned that he was soaking the good carpet with gore. Nothing mattered except beating off this peril to Clare, whose teeth were now chattering in the darkness. Now . . . hot water bottles . . .

Eureka! The gas stove would heat the place, and give a little light too . . . why hadn't he thought of that at first? Why, for that matter, hadn't he thought of using the blankets off his couch-bed? They surely did exploit your stupidity!

The hot water bottles were in the kitchen. He began to explore his way through the living room.

The darkness was clammy. Windows were dim presences, hardly revealing their own positions. A radiator, when he touched it, was cold as drowned bones. For an endless moment he was groping through a subterranean passage, the weight of ancient rocks pressing down in a sentient and malignant desire to blot out his tiny flicker of life. This was a Thing with which one could have no compromise, because its very being was the sucking down of human aspiration and dream. Its only communication was hate and recognition that he was a special focus of danger, because

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he knew It for what It was and might rally resistance to It. It was attacking him through Clare; he stood alone between her and faceless Chaos. The bright, somewhat shoddy little apartment had melted like a fragile surface to show an abyss of death.

What would that Presence be like if It once organized and gained the upper hand?

He must not pause, or It *would* gain the upper hand . . .

His touch found the stove where it should be. It had no pilot burner, and he had to locate the match holder. With grim deliberation he struck a match. The instant, blinding flare was no friendly light. He angled it till it burned steadily, then turned on the gas. The gust of air that always precedes the flow from a long-disused burner blew out the match. With the same measured restraint, he got another. But tension and vexation made him strike it a little too petulantly. As the head plumed into flame, it snapped off and vaulted into a far corner.

For a terrifying instant, he thought it had gone into the trash basket full of waxed wrappings and other tinder . . . he dove after it, and struck his bruised cheek sickeningly against a table-corner . . . the match-head died impotently.

He found himself exulting aloud: "Failed, you little bastard!"

On the third try, he got the burner lit, and its eldritch, blue glare made it easier to light the others and get on a kettleful of water. He looked at the flame and admitted he was afraid to bundle Clare out here where it would soon be warm. If he didn't break his neck, or hers, he would probably pitch the two of them into the stove.

While the water was heating, he impulsively went to inspect the fire escape. The window showed nothing but reflections of the burners and his own shadowy image. He raised the sash, and looked out . . .

No wonder the power was off! The street lamps still shone, far below; but they revealed sleet falling like molten drops in Inferno; the trees were deep-sea corals and the windowpane was opaque as a sheet of paraffin.

QUEER nausea and faintness swamped him . . . He gripped the sill, and his fingers slipped on the sheath of ice. For a moment he thought he had lost balance and was toppling in the grip of gravity, *Their* master-force, over the low sill . . . Even as he recovered, he could imagine his own nightmare howl as he plunged past scared neighbors' windows

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to silence on the icy concrete.

He grunted, stepped back, closed the window. He still felt giddy . . .

Then he saw the dark smears on the floor. It took an exploring finger to explain them. He grunted again, a sour sound. Who wouldn't feel giddy if they'd been bleeding like a stuck pig! It took twice as long as it should have to put on a pressure bandage with a napkin.

The water was too hot, now. He hung the bottles on a hook over the sink while he poured the scalding fluid into them. As he balanced the clumsy kettle, he slipped just a little on a smear of blood and swung the spout where his wrist might have been. But that was a waning threat, he realized—a mere parting shot by a repulsed enemy. The knives, glassware, electrical gadgets, bulks of furniture, all glinted in the blue light, demons and imps ready to frustrate and harass; but the deeper Power had withdrawn—temporarily.

He got the bottles snuggled beside Clare, who murmured gratification.

At that juncture, the lights went on . . .

NEXT morning, the paper said: EIGHTEEN DIE IN FREAK STORM. There were accounts of linemen slipping to death, highway crashes, frozen tramps, fractured skulls.

Just a skirmish, thought Carl. Imagine that situation spread over the whole country—millions of situations like mine last night, year after year . . .

Driving back to the Institute, he tried to keep his mind on the streets, so that last night could fall into perspective. Soon it began to . . . soon he was smiling a little. But, said his semi-conscious, one thing was sure: Whatever the final verdict on the Major's theory—even if he's wrong—he's wrong with a damn good case!

Carl flung himself into his duties till Matt Loftus came around, about mid-afternoon, flourishing a crisp, folded document. "This is it, son!" said Matt. "We lose the Major, and the Major regains his right to life, liberty and the rebuttal of the inanimate. Want to join the Liberation Committee?"

The Major listened to Matt's announcement with his usual courtesy, but with such reserve that that normally self-assured medico ended rather lamely: "Maybe we should have told you this was coming along, sir. But I figured it as a sort of Christmas surprise. Anyway, we just need your signature . . ."

The Major scanned the paper and then laid it on his work-

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bench, smiling a little sadly. He said, "I appreciate your efforts, Doctor, and even more I appreciate your motives. But you don't quite understand."

"I—what? What don't I understand?"

The Major seated himself and caressed his mustache for a long moment. Then: "Outside I'd be a target for a concerted attack. They *know* I'm the greatest menace to Them on Earth, and They'd even risk unmasking Themselves—knowing most people would simply gawk at the most fantastic series of accidents and never draw an inference. I wouldn't last a month. Here, I'm safe, with everything under control."

Matt's face was a study: "But . . . what about alerting other people? Don't you have a duty to preach your theory and so on?"

Carl glanced sharply at his friend. That *was* humoring a patient!

"Why, Doctor," said the Major. "I have the best possible audience right here, funny as it sounds. You of the *staff* are the people best equipped to appreciate my theory—scientists, but not convention-bound theorists. You're not only medical men, used to dealing with things as they are: you're psychiatrists, whose job is distinguishing between the rational and the irrational. You can analyze vital phenomena better than an engineer such as myself. And you're the people most likely to be listened to in turn, and best able to defend yourselves from the inevitable attacks by the enemy."

HIS mild but steady gray eyes considered the young men, and the corners of his mustache quirked: "What better converts could I have than you two?"

Carl turned and stared at Matt, eyes questioning.

Matt set his jaw: "Yes, I'm going to—to follow it up. To see where it goes. And I wouldn't say so till I was sure of at least one competent associate . . . you *are* with me, aren't you?"

"Yes," said Carl, with sudden complete conviction.

The Major leaned back triumphantly. "You see! Of course, this place does put a certain stigma on my ideas. But with the safety factor, and now with grade-A channels, why should I leave? Do you think I'm crazy?"

—H. CHANDLER ELLIOTT

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PROJECT HUSH

By WILLIAM TENN

The biggest job in history and it had to be done with complete secrecy. It was— which was just the trouble!

I GUESS I'm just a stickler, a perfectionist, but if you do a thing, I always say, you might as well do it right. Everything satisfied me about the security measures on our assignment except one — the official Army designation.

Project Hush.

I don't know who thought it up, and I certainly would never ask, but whoever it was, he should have known better. Damn it, when you want a project kept secret, you *don't* give it a designation like that! You give it something neutral, some name like the Manhattan and Overlord they used in World War II, which won't excite anybody's curiosity.

But we were stuck with Project

Illustrated by DICK FRANCIS

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Hush and we had to take extra measures to ensure secrecy. A couple of times a week, everyone on the project had to report to Psycho for DD & HA—dream detailing and hypnoanalysis—instead of the usual monthly visit. Naturally, the commanding general of the heavily fortified research post to which we were attached could not ask what we were doing, under penalty of court-martial, but he had to be given further instructions to shut off his imagination like a faucet every time he heard an explosion. Some idiot in Washington was actually going to list Project Hush in the military budget by name! It took fast action, I can tell you, to have it entered under Miscellaneous "X" Research.

Well, we'd covered the unforgivable blunder, though not easily, and now we could get down to the real business of the project. You know, of course, about the A-bomb, H-bomb and C-bomb because information that they existed had been declassified. You don't know about the other weapons being devised—and neither did we, reasonably enough, since they weren't our business—but we had been given properly guarded notification that they were in the works. Project Hush was set up to counter the new weapons.

Our goal was not just to reach the Moon. We had done that on 24 June 1967 with an unmanned ship that carried instruments to report back data on soil, temperature, cosmic rays and so on. Unfortunately, it was put out of commission by a rock slide.

An unmanned rocket would be useless against the new weapons. We had to get to the Moon before any other country did and set up a permanent station—an armed one—and do it without anybody else knowing about it.

I guess you see now why we on (*damn* the name!) Project Hush were so concerned about security. But we felt pretty sure, before we took off, that we had plugged every possible leak.

We had, all right. Nobody even knew we had raised ship.

WE landed on the northern tip of Mare Nubium, just off Regiomontanus, and, after planting a flag with appropriate throat-catching ceremony, had swung into the realities of the tasks we had practiced on so many dry runs back on Earth.

Major Monroe Gridley prepared the big rocket, with its tiny cubicle of living space, for the return journey to Earth which he alone would make.

Lieutenant-colonel Thomas Hawthorne painstakingly examined our provisions and portable quarters for any damage that

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might have been incurred in landing.

And I, Colonel Benjamin Rice, first commanding officer of Army Base No. 1 on the Moon, dragged crate after enormous crate out of the ship on my aching academic back, and piled them in the spot two hundred feet away where the plastic dome would be built.

We all finished at just about the same time, as per schedule, and went into Phase Two.

Monroe and I started work on building the dome. It was a simple pre-fab affair, but big enough to require an awful lot of assembling. Then, after it was built, we faced the real problem —getting all the complex internal machinery in place and in operating order.

Meanwhile, Tom Hawthorne took his plump self off in the single-seater rocket which, up to then, had doubled as a lifeboat.

The schedule called for him to make a rough three-hour scouting survey in an ever-widening spiral from our dome. This had been regarded as a probable waste of time, rocket fuel and manpower—but a necessary precaution. He was supposed to watch for such things as bug-eyed monsters out for a stroll on the Lunar landscape. Basically, however, Tom's survey was intended to supply extra geological and astronomical meat for the report which Monroe was to carry back to Army HQ on Earth.

Tom was back in forty minutes. His round face, inside its transparent bubble helmet, was fish-belly white. And so were ours, once he told us what he'd seen.

He had seen another dome.

"The other side of Mare Nubium—in the Riphaen Mountains," he babbled excitedly. "It's a little bigger than ours, and it's a little flatter on top. And it's not translucent, either, with splotches of different colors here and there —it's a dull, dark, heavy gray. But that's all there is to see."

"No markings on the dome?" I asked worriedly. "No signs of anyone — or anything — around it?"

"Neither, Colonel." I noticed he was calling me by my rank for the first time since the trip started, which meant he was saying in effect, "Man, have *you* got a decision to make!"

"Hey, Tom," Monroe put in. "Couldn't be just a regularly shaped bump in the ground, could it?"

"I'm a geologist, Monroe. I can distinguish artificial from natural topography. Besides—" he looked up—"I just remembered something I left out. There's a brand-new tiny crater near the dome—the kind usually left by a rocket exhaust."

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"Rocket exhaust?" I seized on that. "*Rockets,* eh?"

TOM grinned a little sympathetically. "Spaceship exhaust, I should have said. You can't tell from the crater what kind of propulsive device these characters are using. It's not the same kind of crater our rear-jets leave, if that helps any."

Of course it didn't. So we went into our ship and had a council of war. And I do mean war. Both Tom and Monroe were calling me Colonel in every other sentence. I used their first names every chance I got.

Still, no one but me could reach a decision. About what to do, I mean.

"Look," I said at last, "here are the possibilities. They know we are here—either from watching us land a couple of hours ago or from observing Tom's scoutship—or they do not know we are here. They are either humans from Earth—in which case they are in all probability enemy nationals—or they are alien creatures from another planet—in which case they may be friends, enemies or what-have-you. I think common sense and standard military procedure demand that we consider them hostile until we have evidence to the contrary. Meanwhile, we proceed with extreme caution, so as not to precipitate an interplanetary war with potentially friendly Martians, or whatever they are.

"All right. It's vitally important that Army Headquarters be informed of this immediately. But since Moon-to-Earth radio is still on the drawing boards, the only way we can get through is to send Monroe back with the ship. If we do, we run the risk of having our garrison force, Tom and me, captured while he's making the return trip. In that case, their side winds up in possession of important information concerning our personnel and equipment, while our side has only the bare knowledge that somebody or something else has a base on the Moon. So our primary need is more information.

"Therefore, I suggest that I sit in the dome on one end of a telephone hookup with Tom, who will sit in the ship, his hand over the firing button, ready to blast off for Earth the moment he gets the order from me. Monroe will take the single-seater down to the Riphaen Mountains, landing as close to the other dome as he thinks safe. He will then proceed the rest of the way on foot, doing the best scouting job he can in a spacesuit.

"He will not use his radio, except for agreed-upon nonsense syllables to designate landing the single-seater, coming upon the

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dome by foot, and warning me to tell Tom to take off. If he's captured, remembering that the first purpose of a scout is acquiring and transmitting knowledge of the enemy, he will snap his suit radio on full volume and pass on as much data as time and the enemy's reflexes permit. How does that sound to you?"

They both nodded. As far as they were concerned, the command decision had been made. But I was sitting under two inches of sweat.

"One question," Tom said. "Why did you pick Monroe for the scout?"

"I was afraid you'd ask that," I told him. "We're three extremely unathletic Ph. D.s who have been in the Army since we finished our schooling. There isn't too much choice. But I remembered that Monroe is half Indian —Arapahoe, isn't it, Monroe?— and I'm hoping blood will tell."

"Only trouble, Colonel," Monroe said slowly as he rose, "is that I'm one-*fourth* Indian and even that . . . Didn't I ever tell you that my great-grandfather was the only Arapahoe scout who was with Custer at the Little Big Horn? He'd been positive Sitting Bull was miles away. However, I'll do my best. And if I heroically don't come back, would you please persuade the Security Officer of our section to clear my name for use in the history books? Under the circumstances, I think it's the least he could do."

I promised to do my best, of course.

AFTER he took off, I sat in the dome over the telephone connection to Tom and hated myself for picking Monroe to do the job. But I'd have hated myself just as much for picking Tom. And if anything happened and I had to tell Tom to blast off, I'd probably be sitting here in the dome all by myself after that, waiting . . .

"*Broz neggle!*" came over the radio in Monroe's resonant voice. He had landed the single-seater.

I didn't dare use the telephone to chat with Tom in the ship, for fear I might miss an important word or phrase from our scout. So I sat and sat and strained my ears. After a while, I heard "*Mishgashu!*" which told me that Monroe was in the neighborhood of the other dome and was creeping toward it under cover of whatever boulders were around.

And then, abruptly, I heard Monroe yell my name and there was a terrific clattering in my headphones. Radio interference! He'd been caught, and whoever had caught him had simultaneously jammed his suit trans-

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mitter with a larger transmitter from the alien dome.

Then there was silence.

After a while, I told Tom what had happened. He just said, "Poor Monroe." I had a good idea of what his expression was like.

"Look, Tom," I said, "if you take off now, you still won't have anything important to tell. After capturing Monroe, whatever's in that other dome will come looking for us, I think. I'll let them get close enough for us to learn something of their appearance—at least if they're human or nonhuman. Any bit of information about them is important. I'll shout it up to you and you'll still be able to take off in plenty of time. All right?"

"You're the boss, Colonel," he said in a mournful voice. "Lots of luck."

And then there was nothing to do but wait. There was no oxygen system in the dome yet, so I had to squeeze up a sandwich from the food compartment in my suit. I sat there, thinking about the expedition. Nine years, and all that careful secrecy, all that expenditure of money and mind-cracking research—and it had come to this. Waiting to be wiped out, in a blast from some unimaginable weapon. I understood Monroe's last request. We often felt we were so secret that our immediate superiors didn't even want *us* to know what we we were working on. Scientists are people—they wish for recognition, too. I was hoping the whole expedition would be written up in the history books, but it looked unpromising.

TWO hours later, the scout ship landed near the dome. The lock opened and, from where I stood in the open door of our dome, I saw Monroe come out and walk toward me.

I alerted Tom and told him to listen carefully. "It may be a trick—he might be drugged . . ."

He didn't act drugged, though—not exactly. He pushed his way past me and sat down on a box to one side of the dome. He put his booted feet up on another, smaller box.

"How are you, Ben?" he asked. "How's every little thing?"

I grunted. "*Well?*" I know my voice skittered a bit.

He pretended puzzlement. "Well *what?* Oh, I see what you mean. The other dome—you want to know who's in it. You have a right to be curious, Ben. Certainly. The leader of a top-secret expedition like this — Project Hush they call us, huh, Ben—finds another dome on the Moon. He thinks he's been the first to land on it, so naturally he wants to—"

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"Major Monroe Gridley!" I rapped out. "You will come to attention and deliver your report. Now!" Honestly, I felt my neck swelling up inside my helmet.

Monroe just leaned back against the side of the dome. "That's the *Army* way of doing things," he commented admiringly. "Like the recruits say, there's a right way, a wrong way and an Army way. Only there are other ways, too." He chuckled. "Lots of other ways."

"He's off," I heard Tom whisper over the telephone. "Ben, Monroe has gone and blown his stack."

"They aren't extraterrestrials in the other dome, Ben," Monroe volunteered in a sudden burst of sanity. "No, they're human, all right, and from Earth. Guess *where*."

"I'll kill you," I warned him. "I swear I'll kill you, Monroe. Where are they from—Russia, China, Argentina?"

He grimaced. "What's so secret about those places? Go on!—guess again."

I stared at him long and hard. "The only place else—"

"Sure," he said. "You got it, Colonel. The other dome is owned and operated by the Navy. The goddam United States Navy!"

—WILLIAM TENN

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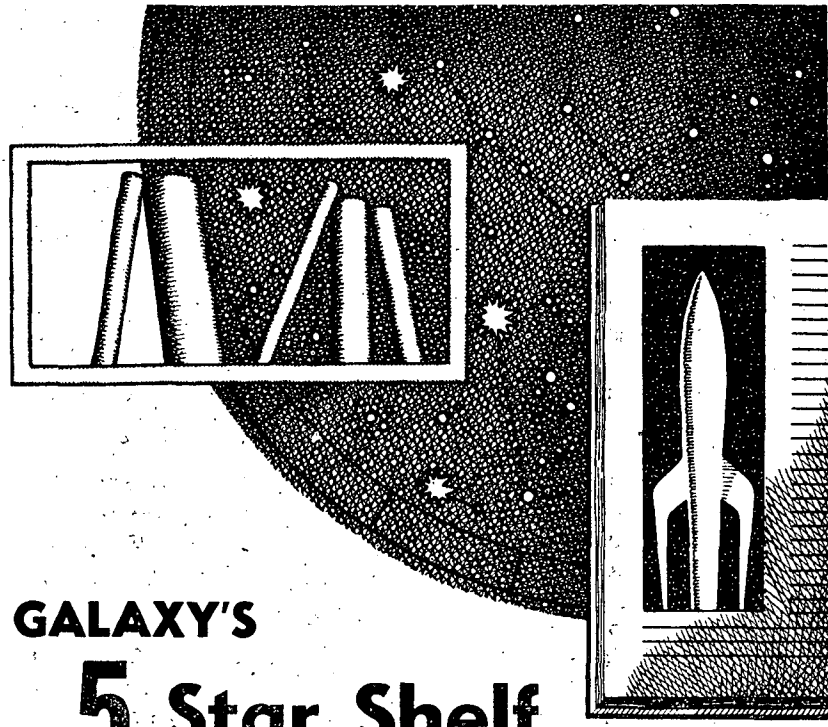

GALAXY'S 5 Star Shelf

FAHRENHEIT 451 *by Ray Bradbury. Ballantine Books, Inc., New York,* 1953. 199 *pages,* $2.50 *cloth,* 35¢ *paper*

THIS is the best thing Ray Bradbury has ever done. Even more, it is among the great works of the imagination written in English in the last decade or more. It is so far in advance of what its author has previously done, one can hardly belive it was written by the author of *The Martian Chronicles.*

GALAXY readers will remember it from the February 1951 issue as "The Fireman." They will, however, hardly be able to recognize this as an outgrowth of that excellent tale.

"The Fireman" was an angry fantasy of a mad world; "Fahrenheit 451" (which, according to the title page, is the temperature required to ignite book paper) is

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an almost Biblical challenge to the human race to stop and consider while there still is time before suicide.

The key idea in both tales is that firemen, put out of work by the invention of completely fireproof buildings, are given the task of *setting* fire, with tanks full of kerosene, to the homes of people who persist in possessing banned books. Practically all books are banned in this society.

However, though the premise is the same, the development in the new version is not as furiously angry as it was in the original. Three years of introspection have cooled off the rage with pity and understanding.

Ideas and philosophies are set down with poetic care, rather than in the fiery fashion of the original. Each character is an unforgettable human being — perhaps the one major similarity between the two versions.

If you begin to balk at some of the more fantastic aspects of the story, read the very last page of the book, the second page of Ballantine's writeup on Bradbury. There you will find how close to reality some of the author's horrible dreams of the future are right now—today.

The book is fattened out with two new short stories, neither of which need detain you long. You must buy the book for its title story, almost novel-length as it is. This is one piece of science fiction that you will never forget, even though you may want to.

PRIZE SCIENCE FICTION. Edited by Donald A. Wollheim. The McBride Co., New York, 1953. 230 *pages,* $3.00

ALTHOUGH this is a pretty slim book for the price—12 stories at 25¢ per—the quality is pleasantly high, in general. Theoretically the first of an annual series to compete with the Bleiler-Dikty selections, this collection is a good one even if it never has a sequel.

Of the 12 stories, nine are B-plus or better—and many may disagree with my feeling that Miller's "The Big Hunger," Coppel's "The Peacemaker" and Brackett's "The Last Days of Shandakor" are too fruity in their concept and style for modern science fiction.

The other stories are tops: Arthur C. Clarke's "All the Time in the World," Derleth's McIlvaine's Star" (previously anthologized), Robert Locke's "Demotion," Pearson and Corwin's "The Mask of Demeter," Beaumont's "The Beautiful Woman," Kornbluth's superb "The Altar at Midnight," Dickson's "Listen," Mark Clifton's "Star Bright," and Russell's "The Timeless

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Ones:" a nice bunch of yarns.

The Kornbluth and the Clifton are from GALAXY. The others perhaps will be entirely new to you.

ATTA by Francis Rufus Bellamy. A. A. Wyn, Inc., New York, 1953. 216 *pages,* $3.00

ATTA, the tale of the life of a man reduced to ant-size and living among ants, is a slight but vivid and occasionally moving story of adventure, somewhat reminiscent of a Robinson Crusoe on a miniature scale.

More important, it is an impressive imaginative re-creation of what Earth must seem like to a person no larger than an ant, and an even more striking picture of what an ant civilization might be like, if there was one.

Mr. Bellamy, once Executive Editor of the *New Yorker,* and of other magizines now dead, posits that ants are intelligent, not entirely creatures of instinct. He draws a detailed picture of their regimented, doctrinaire and bureaucratic society which you will not soon forget.

However, the parts of the book I liked best are those describing the first adventures of Brokell, the man made small, and his relations to his new world where grasses are trees and a tinfoil chocolate bar wrapping becomes impenetrable armor for his protection.

I also thoroughly enjoyed the description of his relations with Atta, the solitary ant whom he saves from death and who befriends him and makes it possible for him to live in his incredible new environment.

This is old-fashioned science fiction, in a sense, but even so it is vividly real and often very moving.

THE STARS: A NEW WAY TO SEE THEM by A. H. Rey. Houghton Mifflin Co., Boston, 1952. 144 *pages,* $4.50

ALTHOUGH astronomy, considered as the study of the constellations, is one of the oldest sciences in the world, it was not until last year that its study by amateurs was made even passably easy and pleasant. It was then that Mr. Rey, German-born but resident in the United States since 1940, published this fine book.

Instead of picturing the constellations with the vague classical-allegorical shapes of tradition or the meaningless geometrical lines of more up-to-date texts, Rey has developed a technique of using straightforward lines connecting the stars in each constellation so that they actually look like a skeleton presentation

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of the figures they are supposed to represent.

Gemini, the Twins, for example, *look* like twin stick-figures, with each important star in the constellation carefully included in the drawing. The same thing applies even to such complicated star groupings as the Great Bear and Hercules with his club.

Not only does the book clearly identify the constellations, in 15 brilliantly simple star charts, but it also presents in 12 more charts a complete calendar of when and where the constellations are visible in the sky at latitude 40 degrees north, together with a one-page timetable to refer you to the correct chart for any hour of the night on any night of the year.

And, to make the book a complete guide for amateur star-gazers, there is an easy, readable introduction to the principles of scientific astronomy that explains everything from the precession of the equinoxes to the difference between solar and sidereal day so clearly that even an astronomical illiterate like myself can understand it.

Graciously written, superbly illustrated by the author, and printed in large type and two colors, this book should become an almost obligatory item in the library of anyone interested in the nature of the ocean of stars, at the bottom of which we humans find ourselves.

BRING THE JUBILEE by Ward Moore. Farrar, Straus and Young, New York, 1953. *Cloth,* $2.50; *Ballantine Books, Inc., New York,* 1953, *paper,* 35¢

ONE aspect of science fiction that has been overworked and yet remains fascinating is the "What If?" type of story. What if Napoleon had won at Waterloo? What kind of world would have existed if Hitler had been assassinated in 1939? And so on. What if—as Ward Moore richly and realistically imagines in this first-rate novel, the "Southrons" had won the Battle of Gettysburg?

Moore, who is a much better novelist than he is science fictioneer, draws a picture of a "United States" consisting of 26 states north of the Mason-Dixon line.

The story is told by one Hodgrins McCormick Backmacker, who was born in 1921 and who died in 1877. The thing was that he died in the world *we*—you and I—know, having changed the course of history by appearing at Gettysburg from the future and inadvertently keeping the Southrons from winning that battle—which, as we all know, they "actually" did not. But if they had—?

In the world he had known as

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child and man, they had. The "United States" was a miserable dependency of the Confederacy, and most of this book is devoted to a palpably, painfully real picture of the serflike and ignorant life of a semi-enslaved Northern population. Rarely have I read a story that has such as acute understanding of how the forces of history are bent by events, not men.

Briefly, the novel tells how Backmacker, born with an unusual quota of curiosity and self-reliance for a Northerner, tries to make something of himself.

He learns to read, gets mixed up in which is called "The Grand Army"—a subversive bunch of saboteurs and petty gangsters who are trying to undermine the imperial Confederacy — escapes, and is finally asked to join an intellectual oasis in Pennsylvania.

There, by various means, he becomes involved with a fantastic girl who invents a thoroughly fantastic time machine and goes back in the machine to Gettysburg to make his "fatal" error.

This is an important original work, much better than the shorter version that appeared some time ago in *Fantasy and Science Fiction.*

KILLER TO COME by Sam Merwin, Jr. Abelard Press, New York, 1953. 251 *pages,* $2.75

WITH every science fiction tale from Sam Merwin's pen that comes off the presses, the quality improves.

The current item, though less science fiction than detective story, has a sharpness and an authority in its writing, plotting and characterizations that make it soar high above his previous efforts. Like any detective story, it is meant solely to entertain, not to edify; but entertain it does, in an expert and colorful fashion.

The tale deals with the ancient fantasy of "possession" in a new way. The work of most geniuses, past and present, has been directed by minds from a ruthless future which take possession of either the unstable geniuses themselves or else of unstable people (often women) who are in a position to change the course of the geniuses' work.

Dr. Julius Conrad, student of genius at the Wellington Institute for Studies in the Humanities, is killed off as he is about to publish a volume actually proving this theory.

Other murders occur, and Journalist Henry Sanford and Detective Joe Luizetti set about trying to solve them. They eventually do so, but with a very wry and uncomfortable payoff.

This is an easy and fast-moving tale.

—GROFF CONKLIN

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THE PASSENGER

By KENNETH HARMON

The classic route to a man's heart is through his stomach — and she was just his dish.

Illustrated by CONNELL

THE transport swung past Centaurus on the last leg of her long journey to Sol. There was no flash, no roar as she swept across the darkness of space. As silent as a ghost, as quiet as a puff of moonlight she moved, riding the gravitational fields that spread like tangled, invisible spider webs between the stars.

Within the ship there was also silence, but the air was stirred by a faint, persistent vibration from the field generators. This noiseless pulse stole into every corner of the ship, through long, empty passageways lined with closed stateroom doors, up spiraling stairways to the bridge and navigational decks, and down into vast and echoing holds, filled with strange cargo from distant worlds.

This vibration pulsed through Lenore's stateroom. As she relaxed on her couch, she bathed in it, letting it flow through her to tingle in her fingertips and whisper behind her closed eyelids.

"Home," it pulsed, "you're going home."

SHE repeated the word to herself, moving her lips softly but making no sound. "Home," she breathed, "back home to Earth." Back to the proud old planet that was always home, no matter how far you wandered under alien suns. Back to the shining cities clustered along blue seacoasts. Back to the golden grainlands of the central states and the high, blue grandeur of the western mountains. And back to the myri-

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ad tiny things that she remembered best, the little, friendly things . . . a stretch of maple-shadowed streets heavy and still with the heat of a summer noon; a flurry of pigeons in the courthouse square; yellow dandelions in a green lawn, the whir of a lawnmower and the smell of the cut grass; ivy on old bricks and the rough feel of oak bark under her hands; water lilies and watermelons and crepe papery dances and picnics by the river in the summer dusk; and the library steps in the evening, with fireflies in the cool grass and the school chimes sounding the slow hours through the friendly dark.

She thought to herself, "It's been such a long time since you were home. There will be a whole new flock of pigeons now." She smiled at the recollection of the eager, awkward girl of twenty that she had been when she had finished school and had entered the Government Education Service. "Travel While Helping Others" had been the motto of the GES.

She had traveled, all right, a long, long way inside a rusty freighter without a single porthole, to a planet out on the rim of the Galaxy that was as barren and dreary as a cosmic slag heap. Five years on the rock pile, five years of knocking yourself out trying to explain history and Shakespeare and geometry to a bunch of grubby little miners' kids in a tin schoolhouse at the edge of a cluster of tin shacks that was supposed to be a town. Five years of trudging around with your nails worn and dirty and your hair chopped short, of wearing the latest thing in overalls. Five years of not talking with the young miners because they got in trouble with the foreman, and not talking with the crewmen from the ore freighters because they got in trouble with the first mate, and not talking with yourself because you got in trouble with the psychologist.

They took care of you in the Education Service; they guarded your diet and your virtue, your body and your mind. Everything but your happiness.

THERE was lots to do, of course. You could prepare lessons and read papers and cheap novels in the miners' library, or nail some more tin on your quarters to keep out the wind and the dust and the little animals. You could go walking to the edge of town and look at all the pretty gray stones and the trees, like squashed-down barrel cactus; watch the larger sun sink behind the horizon with its little companion star circling around it, diving out of sight to the right and popping up again on the

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left. And Saturday night—yippee! —three-year-old movies in the tin hangar. And, after five years, they come and say, "Here's Miss So-and-So, your relief, and here's your five thousand credits and wouldn't you like to sign up for another term?"

Ha!

So they give you your ticket back to Earth. You're on the transport at last, and who can blame you if you act just a little crazy and eat like a pig and take baths three times a day and lie around your stateroom and just dream about getting home and waking up in your own room in the morning and getting a good cup of real coffee at the corner fountain and kissing some handsome young fellow on the library steps when the Moon is full behind the bell tower?

"And will the young fellow like you?" she asked herself, knowing the answer even as she asked the question.

She whirled about in the middle of the stateroom, her robe swirling around her, and ended with a deep curtsy to the full-length mirror.

"Allow me to introduce myself," she murmured. "Lenore Smithson, formerly of the Government Education Service, just back from business out on the Rim. What? Why, of course you may have this dance. Your name? Mr. Fairheart! Of the billionaire Fairhearts?" She waltzed with herself a moment. Halting before the mirror again, she surveyed herself critically.

"Well," she said aloud, "the five years didn't completely ruin you, after all. Your nose still turns up and your cheeks still dimple when you smile. You have a nice tan and your hair's grown long again. Concentrated food hasn't hurt your figure, either." She turned this way and that before the mirror to observe herself.

Then suddenly she gave a little gasp of surprise and fright, for a cascade of laughter had flooded soundlessly inside her head.

SHE stood frozen before the mirror while the laughter continued. Then she slowly swung around. It ceased abruptly. She looked around the compartment, staring accusingly at each article of furniture in turn; then quickly spun around to look behind her, meeting her own startled gaze in the mirror.

Opening the door slowly, she ventured to thrust her head out into the corridor. It was deserted, the long rows of doors all closed during the afternoon rest period. As she stood there, a steward came along the corridor with a tray of glasses, nodded to her, and passed on out of sight. She turned back into the room and

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stood there, leaning against the door, listening.

Suddenly the laughter came again, bursting out as though it had been suppressed and could be held back no longer. Clear, merry, ringing and completely soundless, it poured through her mind.

"What is it?" she cried aloud. "What's happening?"

"My dear young lady," said a man's voice within her head, "allow me to introduce myself. My name is Fairheart. Of the billionaire Fairhearts. May I have the next dance?"

"This is it," she thought. "Five years on the rock pile would do it to anyone. You've gone mad."

She laughed shakily. "I can't dance with you if I can't see you."

"I really should explain," the voice replied, "and apologize for my silly joke. It was frightfully rude to laugh at you, but when I saw you waltzing and preening yourself, I just couldn't help it. I'm a telepath, you see, from Dekker's star, out on the Rim."

That would explain, she thought, his slightly stilted phraseology; English was apparently not his native tongue—or, rather, his native thought.

"There was a mild mutation among the settlers there, and the third generation all have this ability. I shouldn't use it, I know, but I've been so lonely, confined here to my room, that I cast around to see if there were anyone that I could talk to. Then I came upon you considering your own virtues, and you were so cute and funny that I couldn't resist. Then I laughed and you caught me."

"I'VE heard of telepaths," she said doubtfully, "though I've never heard of Dekker's star. However, I don't think you have any right to go thinking around the ship spying on people."

"Sh!" whispered the silent voice. "You needn't shout. I'll go away if you wish and never spy on you again, but don't tell Captain Blake, or he'll have me sealed in a lead-lined cell or something. We're not supposed to telepath around others, but I've been sitting here with all sorts of interesting thoughts just tickling the edges of my mind for so long that I had to go exploring."

"Why not go exploring on your own two feet like anyone else? Have you so much brains, your head's too heavy to carry?"

"Unfortunately," the voice mourned, "my trouble is in my foot and not in my head. On the second night out from Dekker's star, I lost my footing on the stairs from the dining hall and plunged like a comet to the bottom. I would probably have been killed but for the person of a stout steward who, at that mo-

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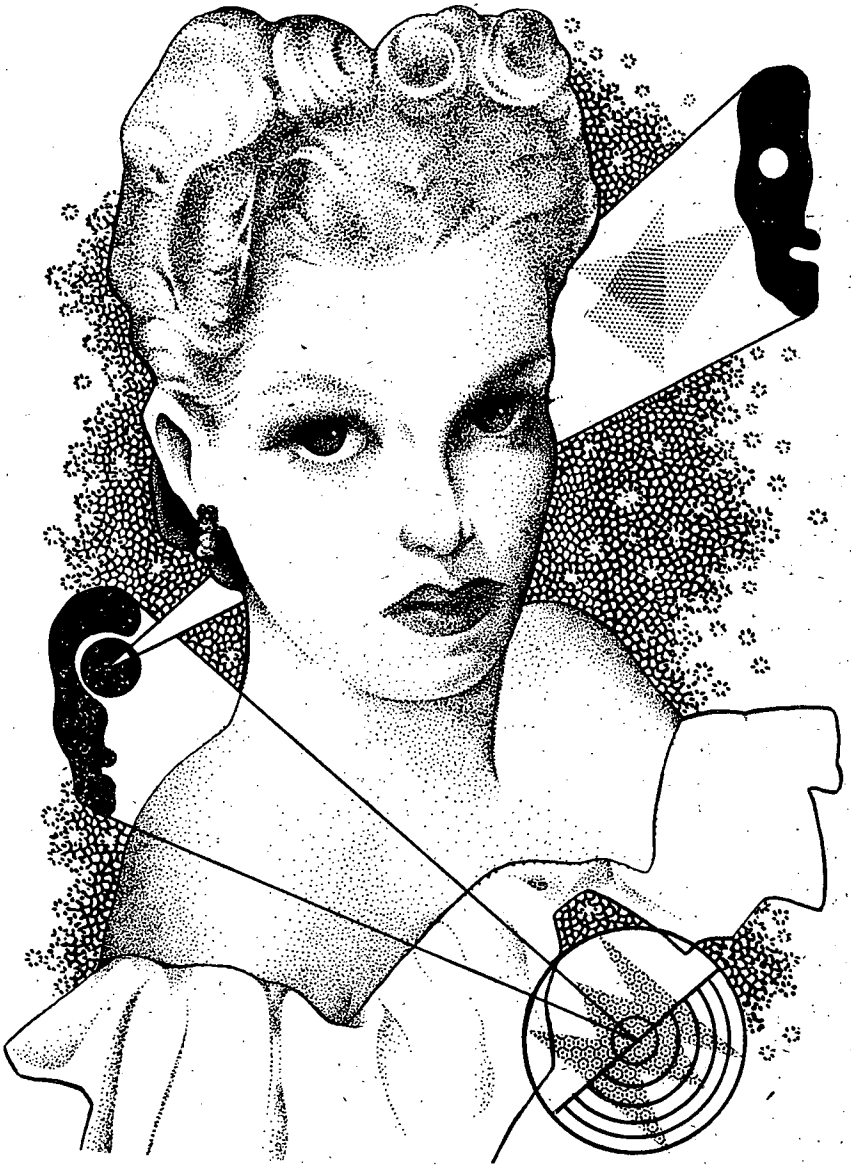

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ment, started to ascend the stairs. He took the full impact of my descent on his chest and saved my life, I'm sure. However, I still received a broken ankle that has given me so much pain that I have been forced to remain in my cabin.

"I have had no one to talk to except the steward who brings me my meals, and, as he is the one whom I met on the stairs, he has little to say. In the morning he frowns at me, at noon he glowers, and in the evening he remarks hopefully, 'Foot still pretty bad?' Thus, I'm starved for conversation."

Lenore smiled at this earnest speech. "I might talk with you for a minute or two, but you must admit that you have one advantage over me. You can see me, or so you say, and know what I look like, but I can't see you. It isn't fair."

"I can show myself to you," he said, "but you'll have to help me by closing your eyes and concentrating very hard."

SHE closed her eyes and waited expectantly. There was a moment of darkness; then there appeared in the middle of the darkness a point of light, a globe, a giant balloon of color. Suddenly she was looking into the corner of a stateroom which appeared to hang in space. In the center of the area stood a handsome young man in a startling black and orange lounging robe, holding on to the back of a chair.

She opened her eyes; for an instant the vision of the young telepath hung in the air over her couch like a ghostly double exposure. Then it faded and the room was empty.

"That's a terrible effort," came his thought, "particularly when I have to balance on one foot at the same time. Well, now are we even?"

Abandoning her post by the door, she moved to the couch and sat down. "I'm really disappointed," she smiled. "I was sure you'd have two heads. But I think you do have nice eyes and a terrible taste in bathrobes." She took a cigarette from her case and lit it carefully. Then she remembered her manners and extended the case to the empty air. "Won't you have one?"

"I certainly would like to. I'm all out of them until the steward brings my dinner. But I'm afraid I'll have to wait, unless you can blow the smoke through the ventilators to me, or unless . . . you bring me one?"

Lenore blushed and changed the subject. "Tell me, what do you do all day in your stateroom? Do you read? Do you play the flute? Do you telepath sweet nothings across the light-years to

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your girl friend on Dekker's star?"

"I'm afraid my telepathic powers are a bit short-ranged to reach Dekker's star," he replied. "Besides, what girl would commune with me through the depths of space when some other young man is calling her from the dancing pavilion? And my musical talents are limited. However, I do read. I brought some books connected with the research I intend to do on Earth for my degree, and I have spent many happy hours poring over the thrilling pages of *Extraterrestrial Entomology* and *Galactic Arachnida*."

"I came better prepared than you did," she said. "Perhaps I could lend you some of my books. I have novels, plays, poetry, and one very interesting volume called *Progressive Education under Rim Star Conditions*. But," she lowered her voice to a whisper, "I must tell you a secret about that last one."

"What is it?"

"I haven't even opened it."

THEY laughed together, her merriment bubbling aloud in her cabin, his echoing silently inside her mind.

"I haven't time to read a novel," his thought came, "and drama always bored me, but I must confess to a weakness for poetry. I love to read it aloud, to throw myself into a heroic ballad and rush along, spouting grand phrases as though they were my own and feeling for a moment as though I were really striding the streets of ancient Rome, pushing west on the American frontier or venturing out into space in the first wild, reckless, heroic days of rocket travel. But I soon founder. I get swept away by the rhythm, lost in the intricacies of cadence and rhyme, and, when the pace slows down, when the poem becomes soft and delicate and the meaning is hidden behind a foliage of little gentle words, I lose myself entirely."

She said softly, "Perhaps I could help you interpret some verses."

Then she waited, clasping her hands to keep them from trembling with the tiny thrill of excitement she felt.

"That would be kind of you," he said after a pause. "You could read, there, and I could listen, here, and feel what you feel as you read . . . or, if you wished . . ." Another pause. "Would you care to come down?"

She could not help smiling. "You're too good a mind reader. A girl can't have any secrets any more."

"Now look here," he burst out. "I wouldn't have said anything,

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but I was so lonely and you're the only friendly person I've come in contact with and. . ."

"Don't be silly," she laughed. "Of course I'll come down and read to you. I'd love to. What's your cabin number?"

"It hasn't got a number because—actually I work on this ship so I'm away from the passengers' quarters. But I can direct you easily. Just start down the hall to your left and . . ."

"My dear sir," she cried, "just wait a minute! I can't come visiting in my robe, you know; I'll have to change. But while I dress, you must take your spying little thoughts away. If I detect you peeking in here at the wrong moment, I'll run straight to Captain Blake and have him prepare his special lead-lined cell for one unhappy telepath. So you just run along. When I'm ready, I'll call you and you can lead me to your lair."

He thought only the one word, "Hurry," but in the silence after he was gone she fancied she heard her heart echoing him, loud in the stillness.

SHE laughed gaily to herself. "Now stop acting like a schoolgirl before the Junior Prom. You've got to get busy and wash and dress and comb and brush." And then to her reflection in the mirror: "Aren't you a lucky girl? You're still millions and billions of miles from Earth and it's starting already, and he's going to do research there for some time, and maybe at the university in your home town if you tell him just how nice it is, and he doesn't know any other girls, you'd have an inside track. Now you'd better get going or you'll never be ready.

"For reading poetry, don't you think this dress is just the thing, this nice soft blue one that goes so well with your tan and shows your legs, which are really quite pretty, you know. . . . And your silver sandals and those silver pins . . . just a touch of perfume . . . That's right; and now a little lipstick. You do have a pretty smile. . . . There, that's right. Now stop admiring yourself and let's go."

She moved to the bookshelf, frowning now, considered, selected and rejected. Finally she settled on three slim books bound in russet leather, in glossy plastic, in faded cloth. She took a little purse from the table, put the cigarette case into it. Then, with a laugh, she took one cigarette and slipped it into a tiny pocket on her skirt.

"I really meant to bring you one," she whispered to the empty air, "but wasn't I mean to tease?"

In the corridor, she walked quickly past the rows of closed doors to the tiny refreshment

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stand at the foot of the dining room stairs. The attendant rose from his stool as she approached, and came to the counter.

"I'd like two frosted starlights, please," she said, "on a tray."

"Two," said the attendant, and nothing more, but his eyebrow climbed up his forehead, hung for a second, then slowly drooped back to normal, as if to say that after all these years he no longer puzzled about a lovely young girl who came around in the middle of a Wednesday rest period, dressed like Saturday night and smelling of perfume, ordering two intoxicating drinks — when she was obviously traveling alone.

LENORE felt a thrill of secret pleasure go through her, a feeling of possessing a delicious secret, a delightful sensation of reckless gaiety, of life stirring throughout the sleepy ship, of a web of secrets and countersecrets hidden from everyone but this unconcerned observer.

She walked back down the corridor, balancing the tray. When a little splashed over the rim of the tall glasses, she took a sip from each, tasting the sweet, cold liquid in her throat.

When she came to the head of the stairs, she realized that she did not even know her telepath's name. Closing her eyes, she said very slowly and distinctly inside her head, "Mr. Fairheart?"

Instantly his thought was with her, overpowering, as breathless as an embrace. "Where are you?"

"At the head of the central stairs."

"Down you go."

She went down the stairs, through more corridors, down more stairs, while he guided her steps. Once she paused to sip again at each glass when the liquid splashed as she was going down. The ice tickled her nose and made her sneeze.

"You live a long way down," she said.

"I've got to be near my charges," he answered. "I told you I work on the ship; I'm a zoologist classifying any of the new specimens of extraterrestrial life they're always picking up. And I always get stuck with the worst quarters on the ship. Why, I can't even call all my suite my own. The whole front room is filled with some sort of ship's gear that my steward stumbles over every meal time."

She went on and on down and down. "How many flights?" she wondered. "Two or twelve or twenty?" Now, why couldn't she remember? Only four little sips and her mind felt so cloudy. Down another corridor, and what was that funny smell? These passages were poorly ventilated in the lower levels; probably that

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was what made her feel so dizzy.

"Only one more flight," he whispered. "Only one more."

Down and along and then the door. She paused, conscious of rising excitement, conscious of her beating heart.

Dimly she noticed the sign on the door. "You—you mean whatever it is you're taking care of is in there with you?"

"Don't be frightened," his persuasive thought came. "It can't hurt you. It's locked in a cage."

Then she slid the bolt and turned the handle. Her head hurt for an instant; and she was inside, a blue and silver shadow in the dim anteroom, with the tray in her hand and the books under her arm and her pulse hammering.

She looked around the dim anteroom, at the spidery tangle of orange and black ropes against the left-hand wall; then at the doorway in the right-hand wall with the warm light streaming through. He was standing in the second room, one hand on the chair for support, the other extended toward her. For the first time he spoke aloud.

"Hello, butterfly," he said.

"Hello," she said. She smiled and walked forward into the light. She reached out for his hand.

Then she stopped short, her hand pressed against an impenetrable wall.

SHE could see him standing there, smiling, reaching for her hand, but there was an invisible barrier between them. Then, slowly, his room began to fade, the light dimmed, his figure grew watery, transparent, vanished. She was standing, staring at the riveted steel bulkhead of a compartment which was lit only by the dim light filtering through the thick glass over the transom.

She stood there frozen, and the ice in the glasses tinkled nervously. Then the tray slipped from her fingers and clattered to the floor. Icy liquid splashed the silver sandals. In the silent gloom she stood immobile, her eyes wide in her white face, her fist pressed to her mouth, stifling a scream.

Something touched her gently at head and wrist and ankle — all over her body. The web clung, delicate as lace, strong as steel.

Even if she had been able to move, she could not have broken free as the thing against the wall began to clamber down the strands on eight furred legs.

"Hello, butterfly," he said again.

—KENNETH HARMON

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Two Timer

By FREDRIC BROWN

Here is a brace of vignettes by the Old Vignette Master . . . short and sharp . . . like a hypodermic!

Illustrated by STONE

Experiment

"THE FIRST time machine, gentlemen," Professor Johnson proudly informed his two colleagues. "True, it is a small-scale experimental model. It will operate only on objects weighing less than three pounds, five ounces and for distances into the past and future of twelve minutes or less. But it works."

The small-scale model looked like a small scale—a postage scale—except for two dials in the part under the platform.

Professor Johnson held up a small metal cube. "Our experimental object," he said, "is a brass cube weighing one pound, two point, three ounces. First, I

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shall send it five minutes into the future."

He leaned forward and set one of the dials on the time machine. "Look at your watches," he said.

They looked at their watches. Professor Johnson placed the cube gently on the machine's platform. It vanished.

Five minutes later, to the second, it reappeared.

Professor Johnson picked it up. "Now five minutes into the past." He set the other dial. Holding the cube in his hand he looked at his watch. "It is six minutes before three o'clock. I shall now activate the mechanism — by placing the cube on the platform —at exactly three o'clock. Therefore, the cube should, at five minutes before three, vanish from my hand and appear on the platform, five minutes before I place it there."

"How can you place it there, then?" asked one of his colleagues.

"It will, as my hand approaches, vanish from the platform and appear in my hand to be placed there. Three o'clock. Notice, please."

The cube vanished from his hand.

It appeared on the platform of the time machine.

"See? Five minutes before I shall place it there, it *is* there!"

His other colleague frowned at the cube. "But," he said, "what if, now that it has already appeared five minutes before you place it there, you should change your mind about doing so and *not* place it there at three o'clock? Wouldn't there be a paradox of some sort involved?"

"An interesting idea," Professor Johnson said. "I had not thought of it, and it will be interesting to try. Very well, I shall *not* . . ."

There was no paradox at all. The cube remained.

But the entire rest of the Universe, professors and all, vanished.

Sentry

HE was wet and muddy and hungry and cold and he was fifty thousand light-years from home.

A strange blue sun gave light and the gravity, twice what he was used to, made every movement difficult.

But in tens of thousands of years this part of war hadn't changed. The flyboys were fine with their sleek spaceships and

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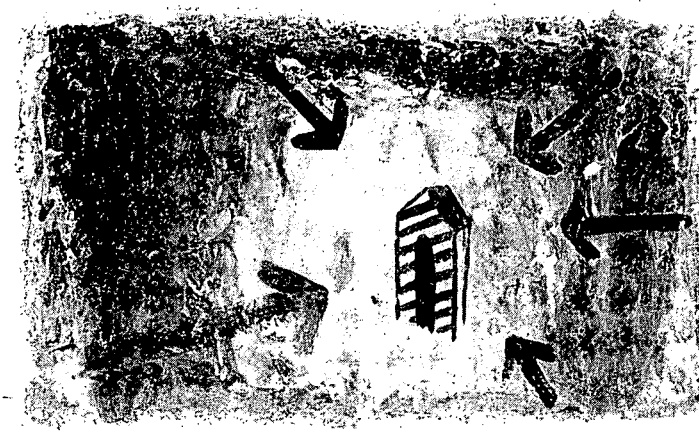

their fancy weapons. When the chips are down, though, it was still the foot soldier, the infantry, that had to take the ground and hold it, foot by bloody foot. Like this damned planet of a star he'd never heard of until they'd landed him there. And now it was sacred ground because the aliens were there too. *The* aliens, the only other intelligent race in the Galaxy . . . cruel, hideous and repulsive monsters.

Contact had been made with them near the center of the Galaxy, after the slow, difficult colonization of a dozen thousand planets; and it had been war at sight; they'd shot without even trying to negotiate, or to make peace.

Now, planet by bitter planet, it was being fought out.

He was wet and muddy and hungry and cold, and the day was raw with a high wind that hurt his eyes. But the aliens were trying to infiltrate and every sentry post was vital.

He stayed alert, gun ready. Fifty thousand light-years from home, fighting on a strange world and wondering if he'd ever live to see home again.

And then he saw one of them crawling toward him. He drew a bead and fired. The alien made that strange horrible sound they all make, then lay still.

He shuddered at the sound and sight of the alien lying there. One ought to be able to get used to them after a while, but he'd never been able to. Such repulsive creatures they were, with only two arms and two legs, ghastly white skins and no scales.

—FREDRIC BROWN

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Men like mules

By J. T. M'INTOSH

Never was there a more exasperating sales job . . . Earth was dying and its inhabitants had to be talked or tricked into leaving!

Illustrated by DICK FRANCIS

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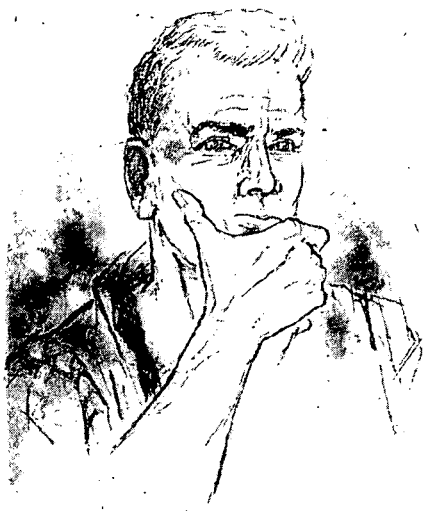

IT wasn't until we were curving in past Pluto that it occurred to any of us there might be difficulties about the job.

"I suppose they'll come back with us all right?" said Tylo suddenly, as she and I picked out Earth among the pinpoints of light ahead.

"Why, sure," I said. "Why would they want to stay?"

"I don't know—I just wondered," said Tylo vaguely.

It ill becomes me as her brother to say so, but Tylo has no brains. She won't mind this admission if I add, as I intend to, that what she lacks in intelligence she makes up for in beauty. I might not have noticed that myself, but I've been told about it—often. She also has something else she can and does use instead of brains. It might be intuition. Anyway, it's the capacity she often shows for finding the right thing to do, without laying any claim to the intelligence the rest of us need to work it out. Without it, she would not be a lieutenant in the Navy.

For the time being, that was all we said on the subject. There had been no suggestion of trouble about this job.

THE little star we were approaching had once been much brighter. Even so, it was stronger than it would be in two hundred years, a hundred years, even fifty. This was the Sun that warmed the world that nurtured the seed that grew to life that developed intelligence that discovered the power that conquered space. The mighty Federation that seeped farther through the Galaxy, year by year, was the house that Jack built.

I'd just been promoted to captain of the *Natal,* a transport ship. Being captain of a transport ship is a strange job, full of ups and downs. Sometimes you've only got the ship itself—the node, it's called—and you feel like the lowest thing in the

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Navy, because the node, for all its power, is hardly bigger than a scout. And scout commanders are only lieutenants really, not exalted Naval brass like captains — like me. Maneuvering around slowly in your ungainly node, a ludicrous little seven-man tub of a ship, the ugliest and second-smallest thing in space, you feel like an admiral in a rowboat.

But when you're on a nine or ten-unit job, and you're pulling a couple of thousand people or hundreds of tons of cargo behind you, then you feel you're somebody. It doesn't matter that your equipage is as ugly and clumsy as ever, and that you still have a crew of only twenty or so to boss around. In terms of life and equipment, you've got as much responsibility as anyone in the Navy and all the other ships in your sector are rerouted to give you the widest of wide berths, which gives you a feeling of power.

This was my first job in actual command of the *Natal,* and it was a big one. It wasn't difficult, at least not on the face of it. All I had to do was pick up the seven thousand remaining Terrans and take them to Yuny. From the technical and navigational point of view, a job like that wasn't beyond any ordinary junior lieutenant in the Navy.

When you consider, however, the people I was transporting, and from where and why, you see why it was a big job. Earth, after all, was the birthplace of the human race. Though not by any means the only place in the Galaxy in which human beings could live, it was certainly the only place where human beings could have evolved.

This evacuation, this last farewell to Mother Earth, meant far more than just the removal of seven thousand people from one place to another.

WE reached Earth and jockeyed the fourteen vast units—separate ships, really—into an orbit around the planet. That took time and care, but no particular skill. The principle of the transport ship is obvious. A powered, independent vessel to carry five hundred people isn't a complete impossibility, but it's impracticable. Two hundred is about the most any single ship is ever built to accommodate. Five hundred, on the other hand, can very easily and comfortably be housed in a vast shell of a vessel which has no motors, no jets, no gyros and which never has to stand the stresses and strains of gravity.

These units are assembled in space, loaded and unloaded in space and, when not in use, are

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left orbiting around a nearby planet until they're needed again. There's next to no limit to the number of units a node can draw. At any rate, no one ever wants to transport more people or goods at any one time than one node can handle.

The only real difference between the transport ships and locomotives drawing trucks across the face of a planet is the absence of gravity. Instead of applying its brakes like a locomotive when it wants to stop, the node has to get around behind the units in free flight, link up again and decelerate from the tail spots. Sounds complicated, but it's not. All the node had to do is move out of the way, decelerate very slightly, let the units in free fall coast on past it, edge itself into position and brake the whole convoy gradually.

I left the maneuvers over Earth to Tylo and Jim Cubert. We were all on duty, the seven of us, but there was nothing for the rest of us to do except check everything Tylo and Jim did.

Hard things are said about the Navy in the Navy, because we always gripe when we have to do what we're told, but it must be admitted that we have most of our personnel problems taped. There's always the right kind of crew for every job. A scout crew would be of no use in a transport ship, and both complements would be utterly unsuitable for duty on a big ship.

THE men and women chosen for transport-ship duty have this in common—they're all relaxed, indolent types—unworried, unhurried, yet capable of bursts of activity for short periods. That's what is wanted in a transport ship. Most of the time you're doing nothing, because there's nothing to do. Discipline hardly exists. A brother and sister wouldn't be officers together in any other Naval ship, but things like that are common enough in transports.

"How did we do?" Tylo asked anxiously. She needn't have been anxious. Once again, she had demonstrated her talent for doing the right thing without, apparently, thinking.

"You couldn't have done much better," I admitted. "That is, provided this orbit is right. Wait till I check it."

Mary Wall checked with me. Mary and Tylo were the only women on the ship. There should have been three, to four men, but there are never enough girls in the Navy. Plenty come in, but most of them soon go out again, for one reason or another.

Mary is a nice girl. But, from the point of view of appearance,

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she couldn't offer competition to a lot of girls who couldn't offer competition to Tylo. That was unfortunate for me. The other four men could at least enjoy looking at Tylo—there wasn't much in that for me.

So I was glad when we cast off, leaving the fourteen units—each with its own lieutenant in charge—coasting around above Earth's atmosphere and dropped toward Earth. It was a long time since I had had any interesting feminine companionship and I was looking forward to meeting the Terrans and a pleasant trip back.

We landed in the Lenny Valley and put on warm coats before we went out. We didn't need them really—the Lenny Valley is on the equator and still quite warm. But the knowledge that, of the once warm and friendly Earth, ninety-nine per cent was now snow and ice made us doubtful about even the few temperate spots.

The Terrans came out to meet us, hundreds of them, and we were astonished to see how lightly clad they were. I don't mean they were dressed like the girls on the adventure magazine covers, but they wore only light, gay clothes, not furs and snowboots as I had half expected. They were an attractive lot—a *very* attractive lot. What struck me particularly at first glance was how many old men were still handsome and athletic and how many middle-aged women had retained both beauty and slimness.

"Hello," said a tall Terran pleasantly. "I'm Wili. This is Jan, and Bel—Meni—Reina—Tian—Martin. Is that enough for you at present?"

I guessed that Wili had introduced seven people to us, including himself, because there were seven of us. I introduced our party in the same bald way. "Captain Tony Wolkin. My sister Tylo—Jim Cubert—Mary Wall—Noblin—Joe Dee—Ramon Barr." In the meantime I noticed such diverse items as Wili's overwhelming personality, Tian's slow, friendly grin—the apparent absence of excitement in the Terrans, or anything more than mild interest—Meni's neat ankles—how quickly my body felt at home on Earth—the strange, unexpected lights in Jan's black hair—the impish humor in Martin's eyes.

WILI was more than just a tall Terran. He was a leader, one of those strange individuals people like and follow, even though there may be nothing likable about them, or any real reason why they should be followed. I knew Wili was one of the people I'd always remember and I had to make an effort before I

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could treat him as an equal, as the leader of one group to another.

"Shall we talk business right away," I asked bluntly, "or would you rather we all got acquainted first?"

"I'd much rather we became better acquainted," he said amiably. "Your ship must be rather crowded—won't you come and make yourself comfortable in my house?"

We walked slowly across the grass. The seven Terrans who had been introduced to us—four women and three men, all young—stayed with us, but the others stayed in the background. I was glad Wili didn't talk. I wanted to get some more impressions.

The attractiveness of the Terrans was even more striking when they were close. I began to understand it a little as I looked at them, one after another.

A restless, passionate, polyglot culture has one kind of physical beauty. I knew that kind, the wild, virile attractiveness of so many Federation planets, where everything is new and raw and human characteristics are shaken up and mixed violently together in the pioneer surge—race, intelligence, strength, passion, impatience, artistic ability, courage.

The Terrans, in contrast, were placid, patient and cool. Not one of them had ever been hurried. Instead of talking loudly and rapidly, because there was so little time to talk and people were too busy to listen for long, they made speech a beautiful thing, sweet and slow and musical. Instead of scuttling about in an eternal race against time, they made every movement fluid and graceful, flowed neatly and artistically into the next. Instead of throwing on garments that didn't need attention, they dressed with such unhurried taste and care that any one of them could have served as a model for those few leisured people in the Federation worlds who really cared for their appearance.

They were artists, every one of them. Those who had talent had it developed—those who hadn't were given artistic education as a substitute for natural taste.

As we approached the Lenn township, we saw that it, too, showed the same taste and craftsmanship. I won't try to describe it. I know what's good when I see it, but I don't know why or how it's good.

We were all warm by the time we entered Wili's house. We shed our coats and followed the seven Terrans into a pleasant room that was half veranda, half sunroom.

I DIDN'T know how much the Terrans had been told. My orders were simply to evacuate

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Earth completely, leaving no single human being there, for reasons which were stated, but which I was not to pass on to the Terrans if I could help it.

Tylo had taken to Wili, I saw. Tylo is a simple soul. Perhaps the best way to describe her is to say she's a kindly, motherly old lady, except that she happens to be twenty-two and beautiful. She always thinks the best of people, no matter how much caution and toughness the Navy tries to impose upon her, or how many wolves she encounters in the course of her amorous adventures.

Wili, I wasn't so sure about, but he seemed to have taken to Tylo too.

"No," she was saying, "I've never been to Earth before. But you know that, don't you? You must know everyone who comes here these days."

"I just wondered," said Wili, "because you've taken everything so much for granted—you and your brother. That isn't usual."

"*What* usually isn't taken for granted?" I asked.

Wili smiled. "The last Naval ship was here two years ago. Its people thought us very quaint. They had cameras and took pictures of us. They even recorded our speech."

"The natives are friendly."

"Exactly! You seem to understand."

I explained something of Naval selection. The last ship was an exploration job. Its personnel, I knew without Wili's hint, would naturally be glorified tourists, fastening on anything that was different from the worlds they knew. Wili listened with interest to my bit of rote.

AS I talked, Jan joined the group, and I wasn't sorry. She was to Wili's group what Tylo was to ours. Tylo, I thought, didn't show up too well beside her. But that could be because Tylo wore a coverall which was neat, but purely utilitarian, while Jan wore a green silk dress which was sheer poetry.

"I begin to have more respect for your Navy," said Wili. "I didn't give it credit for selecting the right human types for its various jobs."

I wanted to say something to Jan, but didn't know what. So I answered Wili. "Tourists have seldom been a good advertisement for their country, or their world. Yet they have the necessary interest, the energy to find things out. And, generally, they are decent enough. They didn't bother you, did they?"

"Not at all," said Jan. "We liked them. Nearly all of them paid me the compliment of tak-

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ing pin-up pictures of me. So I naturally didn't have any objections."

Jan had duly come into the conversation, but there wasn't much I could do with that. She had spoken with irony, a faint shade of resentment, an even fainter suggestion of humor. Anything I said would be wrong. I reflected on the oddity of tourists taking holiday snapshots of Jan, the attractive native. Hadn't they even sensed her superior intelligence and cultural background?

Probably they hadn't. I don't have a tall I.Q., but I had the brains and perception to know at once that the Terrans were more truly cultured than any other people in the Federation. The crew of the exploration ship, however, had no doubt seen that the Terrans climbed stairs instead of using elevators, walked instead of using cars, had no washing-machines, TV or film stars. So, they had rated them attractive primitives, quaint and backward.

"Don't underestimate the exploration crew," I said, feeling an obscure urge to defend the Navy. "There would be some pretty shrewd reports going in—some from people you hardly noticed."

Wili nodded. "I guessed that. We tried to make the reports as accurate as possible."

AGAIN I had that feeling that I was like a child with these people. Don't misunderstand me—I'm not making out that the Terrans are a super-race, or anything like that. But they have culture and education and understanding which probably no one else had time or inclination to acquire these days. And Wili, Jan and probably Martin had intelligence I couldn't match. It was natural enough. They were probably the cleverest of the seven thousand Terrans and I was only an ordinary Naval captain.

Wili got me to state my business exactly when he wanted, not when I felt the time was right. He exchanged a glance with Jan, a glance which said clearly enough that it was just about what they had expected.

"Twenty or so will go back with you," he said. "I'm not sure how many. We haven't made a survey. Say twenty certainly, fifty possibly, a hundred at most."

"But I'm here to evacuate you all," I said, quelling my uneasiness.

"Oh, no," said Wili pleasantly. "The rest of us aren't going. Neither now nor later."

"And if you think we're merely being coy," added Jan indifferently, "you can ask everyone individually. It won't make any difference. We're staying here. We belong here."

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II

IT became more and more clear that they meant it. I didn't do anything about it then. I wanted to think the matter over. But later I talked, I argued, I even threatened.

I had read my instructions again. They were quite definite —Earth to be evacuated completely. I read the stated reasons too, and related them to my own ideas. They made sense.

Earth was still important. All through the Galaxy, on every one of the ninety-four Federation planets, people had a warm spot for the old world. The Yunians, say, were mildly interested in the Collahimans or the Smithsonians or the Carones, but everyone was much more than mildly interested in the Terrans. It was a brake on Federation affairs.

If nothing had been wrong on Earth, or if Earth had been dead and deserted, people wouldn't have spared a thought for it. But now, with the Sun rapidly declining, with Federation scientists seeking explanations and excuses for the occurrence of something they had said could not possibly occur, Earth was always in the Federation's thoughts. It was like an exciting game that wasn't quite over.

Meanwhile, Earth counted too much. There seemed to be no doubt about that. People didn't really *love* Earth, they were just sentimental about it. It was like one of the old tear-jerker deathbed scenes, and it could drag on for years yet. The whole Federation was trying to carry on its multifarious activities with one eye on Earth. The traders, more hard-headed, didn't like it. The governors didn't like it. The Navy didn't like it.

That was what I was to avoid telling the Terrans, if I could. Fortunately, none of the people left on Earth had ever been in any of the Federation cities. They didn't know how our smart, go-ahead Federation citizens sighed and went dreamy-eyed and sentimental when someone sang *Take Me Back to Dear Old Terra.* They didn't know why I had orders to ring down the curtain —so that the audience could go back to work.

AND I agreed that the Terrans shouldn't be told this. They were proud and placid and imperturbable anyway. They were intelligent, cultured mules, but still mules. Perhaps this would make them even prouder and then it would be quite impossible to shift them.

Of course, I could go back and report that the Terrans wouldn't come. I could imagine what would be said at Naval HQ if I

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did. "You were sent to evacuate them, weren't you? Why didn't you?"

Every captain in a Space Navy has far more responsibility than an admiral in a Sea Navy. The admiral has to radio for orders. The captain has to act on the spot. Months, sometimes years may pass before a Federation Navy captain can report back for further orders and return and execute them. Besides, there is the colossal item of expense. Could I go back to Yuny and ask what I was to do now?

I could not.

I had been sent to evacuate Earth and I couldn't go back to Yuny without the Terrans unless I was prepared to say, "I didn't do what I was sent to do, because the situation had changed since I got my orders. Instead I . . ."

The situation hadn't changed. Earth still had to be evacuated, now or later. Anyone could see that with half an eye. Why couldn't the Terrans? Why did they choose to be mulish?

I set out to make them see it. I argued with Wili, with Jan, with Bel, with Martin, with people I sought out myself, just to see what the ordinary Terran thought.

Already, nearly all of Earth was frozen to death. Only the narrow belt that got the greatest concentration of the Sun's feeble rays had enough heat and light. True, Earth's inner fires still burned. By comparison with some of the barren worlds which were only now being colonized, Earth was still young. Earth, however, was dependent on a sun which had failed her. Hurricanes raged over most of the planet's surface, blizzards hid the dead rock from sight. What had once been the Land of the Midnight Sun now had hardly any light at all.

There were still warm spots on the equator. I gathered that the Terrans sometimes went to swim in tepid pools, in regions where the temperature was in the seventies—for a time. But only the Lenny Valley had the small range of temperature to which human beings are accustomed. A sort of Shangri-la, it was a refuge from the blizzards outside, the biting cold, the tearing winds, the floods, even the occasional, capricious heat.

I saw in a few days that people could live quite comfortably in Lenny Valley with very little shelter, without artificial weather control, without mechanization. They grew crops on the slopes, with hydroponics a standby. They kept cows and sheep and poultry and generally led a simple, fairly easy but full life divided among agriculture, building,

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reading, music, weaving, drama, painting and a hundred other things. It was idyllic—but so ephemeral.

Next year, or in ten years, the shirts would become heavy tunics, the light sandals heavy boots, the graceful skirts thick, heavily lined trousers. The crops would die. The cattle would die. Even the people would begin to die, as life became harder. And there would be nowhere on Earth to go. When Lenny Valley became cold, everywhere else would be colder. Unless the Federation forgot its pique at being turned down before and sent another transport ship—for the Terrans had nothing like a spaceship of their own—the Terrans would die, a few at first, then all in a rush.

It was so unreasonable, so obstinate, so untypical of Wili and Jan, that I wondered if they were quite sane. I knew why they wanted to stay on Earth. It was natural—I could understand that myself. But not to leave it, when they obviously must—were they relying on the Federation to keep sending ships? If so, the sooner they were disillusioned, the better. The Navy isn't inhumane, but it does things like this in its own time.

Sending a ship on a long and fantastically expensive journey every few years, to see if the Terrans were ready to leave yet, had no place in Naval economics. No one was prepared to calculate, after being so wrong already, how long the Sun would radiate energy at roughly its present rate. The Navy's plan, the sensible plan, was to evacuate the Terrans now, earlier than necessary, instead of coming back, possibly just too late, to rescue them.

If the situation was as it seemed to be, I clearly had to take the Terrans away by force if necessary. If they were going to act like mules, I'd have to treat them as mules. I told Wili that.

He laughed. "You wouldn't have told me that if you meant to do it, Tony," he said—he still persisted in being friendly. "And I wouldn't be laughing, if I thought you could do it. But though you've got plenty of power in that ugly little ship of yours, how are you going to use it to get seven thousand of us in those shells out in space, when we won't come? How are you going to use your force of seven—even your force of twenty-one—to make us?"

HE was right. Evacuating seven thousand unwilling Terrans with the force I had was like building ships to accommodate five hundred people. It wasn't downright impossible, but it was highly impracticable.

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"I might," I said on another occasion, to Jan this time, "have your determination to stay here ruled attempted suicide. In such a case, you could be taken into protective custody and removed to safer worlds."

"How true!" sighed Jan, not very interested. Jan never did seem very interested in anything. "But, if you try to do this in a legalistic way, look at all the shuttling back and forth there's going to be between here and the Federation worlds. Will that make you popular?"

It wouldn't. I had to abandon that idea. And it was the same with everything else I thought of.

Once Jan and I walked a mile or so down the valley, and I refrained from mentioning my mission. For the moment, I was more interested in Jan. I'm not very good at making guesses about groups like the Terrans or nations or races. But I can make pretty good guesses about individuals. I was beginning to have an idea about Jan. She was young, beautiful, intelligent—yet bored, resentful, almost apathetic. Nevertheless, I was sure she was made for happiness, not misery. She didn't have the capacity for enjoying misery that a real pessimist has.

"Suppose I tried to kiss you," I wondered aloud, "what's likely to come of it?"

"You'd probably succeed," said Jan indifferently. Being kissed, apparently, was one of the many things that didn't matter at all.

I kissed her. Then I looked at her, puzzled.

"Have I purple teeth?" she asked resentfully. "Has my nose turned upside down?"

"I wish I understood you, Jan."

"No one ever understands anyone."

I shook my head. "Not one of your more intelligent remarks, Jan. You know perfectly well what I mean."

"Why should I think for you?"

I tried to take her in my arms again, but she fended me off.

"May I have three guesses?" I asked.

"About what?"

"You. Why you're always angry."

"I'm not angry," she retorted angrily.

"People are generally angry," I said thoughtfully, "when they think they've made a bad mistake."

She went white. "You can give yourself ten marks for that," she said bitterly. "I made a mistake all right. Now let's go back."

"I haven't had my three guesses yet. One—you can't make up your mind whether to leave Earth or stay."

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"Wrong. I'm staying, but I don't really care much."

"Two—you love Wili, and he won't have anything to do with you."

She didn't do a thing. She simply stood still and stared at me, expressionless.

"Three—" I said, "that being so, you've dedicated your life to showing everyone how completely your heart is broken."

Her eyes flashed dangerously at that. But presently she had control of herself again. "It's none of your business," she said at last. "It isn't Wili anyway. And it has absolutely nothing to do with you and why you're here, so forget it, will you?"

'I can't very well do that."

We were sitting on a hump of grass. I took Jan's hand. She seemed too surprised to do anything about it. It hadn't occurred to her, apparently, that my kissing her like that had been anything more than a conventional recognition of the fact that she was an attractive girl.

"No," I admitted, "perhaps it has nothing to do with why I'm here. But things don't come neatly packaged, everything partitioned off from everything else. They mingle with each other—anyway, I can't just forget it, Jan. Would you laugh if I said I fell in love with you at first sight?"

"I'm not laughing," said Jan. "But you're exaggerating."

"A little. But it's true that, since I first saw you, I've wanted to know you better, find out more about you . . ."

She moved restlessly and freed her hand. "Look, Tony," she said, not unkindly, "I still think you'd better forget the whole thing."

"Isn't there anything I can do?"

"About what? Never mind. Let's go back. This time I mean it."

We went back then, after one of the most unsatisfactory love scenes in history.

III

IT was probably my preoccupation with Jan which prevented me from seeing something very obvious about the Terrans for so long. The course of Tylo's possibly true love was running much more smoothly. She adored Wili more and more every day and he seemed quite prepared to reciprocate. I didn't interfere. I didn't think Tylo's intuition would let her down. She would know when to advance and when to retreat.

She was with me in the control room one sunny afternoon when half a dozen young Terrans, Wili and Jan among them, came out and dropped lazily on the grass

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between the ship and the township to sun-bathe. I glanced quizzically at the wall thermometer. Sixty-one, and if that was in the shade it was also out of the light breeze that was blowing outside. Still, for Lenny Valley it was undoubtedly a warm day and the Terrans were used to slightly lower temperatures than we were.

"Tony," said Tylo hesitantly, looking out at them.

"Yes?"

"Do you think they'd mind if I went out and joined them?"

"Not in the least."

I thought she was hinting that I should go out with her too, for company, but I had something else in mind. I wanted to look closely at the Terrans when they didn't know I was looking at them. I wanted to hear what they said, in case they dropped some clue about why they were remaining so stubbornly, so unreasonably on a world which could support them for only a short time longer.

Tylo hesitated a little longer, then went out. The Terrans were two hundred yards from the ship, but in my control room I had gadgets I could use to count the hairs on their heads if I liked. Merely hearing what they said, bringing them to within an apparent six feet of my eyes, was nothing.

I looked at Jan first, of course. Now that I had some sort of key to her personality, I seemed to understand her better every time I saw her. Her emotions were too deep. She was the kind of person who was always liable to be hurt, and seriously hurt, by things which would trouble others for five minutes and then be forgotten.

She had loved, not wisely, but too well. And I began to sense whom she had loved. There was something taut about the way she looked at Tian, something strained about the way he smiled at her. Tian was married to Meni, who was there, too. I didn't try to guess what had happened. The details didn't matter. What did matter was that Jan had received a wound that wasn't healing as it should.

EVERYTHING the Terrans made, everything they wore, showed what an artistic people they were. When Tylo joined the group of sun-bathers, the difference between her and the others was a mild shock. She had put on a bathing suit, the usual two-piece affair, and on any of the Federation worlds the result would have been declared just about perfect.

Beside Jan's outfit, however, Tylo's was suddenly crude, even a little embarrassing. It covered

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what was usually covered and went to great trouble not to cover anything else. Tylo wasn't dressed, she was censored. Jan, on the other hand, wore a lovely asymmetrical sunsuit, which was equally unconcerned at revealing a lot that Tylo's covered and at concealing much that might decently have been exposed. It was fine art beside shoddy workmanship.

Rather to my surprise, Tylo noticed this at once. She wanted to borrow a sunsuit like the Terran girls', and seemed puzzled when they all agreed it was impossible.

"Nothing that anyone wears can ever suit anyone else exactly," Meni explained. "If it's right for you, it must have been utterly wrong for whoever lent you it."

"Surely a sunsuit like Jan's . . . ?" murmured Tylo hesitantly.

"No," said Meni decidedly. "Definitely not! You and Jan . . ." And she went on to point out the various anatomical differences, differences of muscular tension and differences in patterns of movement, that made Jan's suit quite impossible for Tylo. Tylo agreed doubtfully, not pretending to an artistic appreciation she didn't have.

"Later," Meni promised, "I'll make you a dress."

"The Naval uniform," Wili observed, "happens to suit your brother. He looks quite passable in it. But not you, Tylo. Promise you'll never wear it again while you're here."

"I promise," said Tylo happily, glad to be able to promise Wili anything.

THEY talked about sun-bathing, swimming and then about the Terran way of life in general. Tylo diffidently mentioned, from her experience of other worlds, a few changes which would soon have to be made.

The Terrans agreed placidly with every word she said.

That was the inexplicable thing about it all. It would have made some kind of sense if the Terrans had argued about the future and declared passionately that the Sun would never die. But they agreed, with the utmost reasonableness, that soon the kind of life they were living would be impossible.

I know I was dumb. It wasn't until I had ceased to pay any attention to what Tylo and the Terrans were saying, and had lost myself in rather wistful contemplation of Jan's charms, that I caught my first glimpse of the obvious. I cursed myself briefly, thought for a moment and went out after Tylo.

I went straight to the sunbathers and looked down at Wili.

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"I suppose I should be ashamed of myself," I said, "but it's only just struck me that you must have a refuge somewhere."

Jan looked up with a shadow of a smile. I got the impression she was mildly glad I'd worked that out at last, as if the other Terrans had said I was too stupid to see it and she'd said I wasn't.

"You must have atomic power, of course," I went on, "though you don't use it here. You haven't forgotten your science, after all. You're just having a last holiday—from a mechanized culture before you retire to it for ever. You prefer even a mechanized culture on Earth to any kind of life anywhere else."

Wili nodded coolly. "You've even got the name," he said. "That's exactly what we call it—Refuge."

"Underground?"

"No. It's in a valley like this."

"Then what's the point? How is it a refuge?"

"Tomorrow," said Wili, "we'll take you and Tylo to see it. Then you'll know."

THEY seemed quite unconcerned. It wasn't clear whether they'd been hoping I wouldn't see that they must have a second string to their bow if they seriously intended to remain on Earth, or had expected me to see it long since. They were so simply, so completely sophisticated that a Yahoo like me was always in deep water.

Soon after that, Tian, Meni and Tylo went away together. Gradually, Jan and I were alone, and we had another of our frustrating interludes.

I needn't set down in detail what I said—it was sincere and thoroughly conventional. I even told her I couldn't live without her.

She listened indifferently and said at last, "Kiss me."

"Why?" I asked perversely. "What good would it do?"

"What good does anything ever do?" asked Jan chacteristically.

"I want you, not a kiss and a hug that only makes me want you more."

"Then you can have me."

I gaped. "What do you mean?"

"That! We're rather a moral lot as a rule, we Terrans. The others won't approve. But I don't think it matters. Where and when?"

I had a strange, tight feeling inside me that I couldn't identify. "That wasn't what I had in mind," I said, my voice seeming to come from a long way off. "I want to marry you."

"That would be stupid. If I still care for anything, it's keeping my word. I wouldn't make

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all those marriage vows when I don't mean them."

"What's the matter with you, Jan? Tian isn't worth it. Nobody's worth it!"

"So you know it's Tian."

"Never mind that. Because you can't have the man you want, it isn't the end of everything."

That rare flash of humor came out from the shadows and she actually smiled. "I thought you said a moment ago that you couldn't live without me?" she said.

I took the only way out of it. "That was a lie," I said. "I could live without you, but I'd rather not."

She smiled again, but the bitterness was back. Involuntarily I dropped beside her. I only wanted, obscurely, to protect her, but when I touched her all my good resolutions dissolved. I kissed her again and again, holding her first this way, then that. I kissed her arms and her throat and her shoulders, knowing that next second I should have to get up and be calm and controlled, but not this second, not this kiss.

EVENTUALLY, however, we reached the point when I had to let her go and force myself away from her. I was controlled, though I wasn't calm.

"I'm sorry," I said flatly.

"What for? I wasn't fighting."

True, but she hadn't been responding either—not really.

"What would free you?" I asked. "If Tian died, would that do it?"

"You're not thinking of killing him, are you?"

"Would that free you?" I persisted.

"I think I've always known," she said slowly, "that I could free myself whenever I liked."

"Then why not do it and stop play-acting?"

She was annoyed. "Who's play-acting?"

"You, with your don't-care, nothing-matters pose. You're pretending to everybody, particularly yourself, that yours was such a great, true love that when Tian wouldn't have you your whole life was wasted."

"Go away," she said. She was rigid with fury. Her muscles were taut and she panted a little. I had never seen anyone so visibly, physically angry.

I wanted to stay and make her release all that passion, somehow. Without being a psychologist, I felt it must be a good thing for her to get some of that violence out of her. But I didn't know what she might do, and I couldn't afford to let her interfere with my main job on Earth.

I turned and walked toward the ship, without a glance back at Jan.

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WORDS often seem to be inadequate to describe Earth and the Terrans. And if that was true of their voices, their appearance, their clothes and the simple buildings of Lenn, how much more true it was of Refuge.

Wili had invited only Tylo and me and I didn't ask to take the rest of my crew along. Of the Terrans, there were Wili, Tian, Meni, Martin and Jan. Jan neither sought my company nor made any attempt to avoid it. She ignored completely the incident of the day before.

I wore my uniform, secure in the knowledge that I looked quite passable in it. I was also fully aware how obvious it was that I was a man from another world. Tylo was already almost assimilated by the Terrans, for though she still moved as she always had, she was wearing the dress Meni had made for her, and it subtly added grace to everything she did. Her voice had always been soft and musical, more like the Terrans' than most Federation voices. Now she was frankly imitating their speech, with fair success, for her ear for music was better than her eye for beauty.

The clothes the Terrans and Tylo wore for the expedition should have given me a strong clue about Refuge. They were as simple as ever, but they suggested a much more highly civilized, less primitive culture. They weren't meant to keep the wearer warm, for one thing. The Terrans weren't in the slightest concerned about Federation standards of modesty, judging by the way Jan's breasts and Tylo's tummy were incorporated in the very design of the dresses they wore. Yet no one wore anything which was sexy or exhibitionist.

In the cases of Jan and Tylo, as in the others, one could see that the aim was pure beauty, not sensuality, and that it had been gloriously achieved. I didn't feel in the least disturbed on Tylo's account, as I would have been, say, if she had made a similar exhibition of herself at a Yunian ball.

The subway was the first surprise, but in view of the rest it's hardly worth mentioning. In one of the buildings we hadn't previously been inside, we went downstairs and found ourselves in a nicely designed subway station. We had known that the Terrans had available to them the mature technology which had built the starships, but this was the first indication that they still used any of it.

THERE was no way of telling how far the car took us. Since the tunnel was a sealed vacuum, it may have gone pretty fast—

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acceleration was so smooth that it didn't tell us much. Tylo ingenuously asked how far we were going, but Wili, who had been attending her very closely since we started, merely smiled and shook his head.

I sat in back with Jan. There was a tacit understanding among the Terrans that Jan and I, and Wili and Tylo, should be left together. They neither forced themselves on us nor embarrassed us by leaving us too obviously to ourselves.

"If Wili marries Tylo," Jan remarked suddenly, "will she stay here?"

The question wasn't merely startling, it left me no possible answer. As far as I was concerned, the question of the Terrans remaining on Earth didn't arise. Far less, then, did the question of Tylo staying too.

I said the only thing I could think of. "If you marry me, will you come to Yuny?"

She was less bitter and resentful, a much more pleasant companion than usual—which seemed strange after our last conversation. She said easily, "Let's leave out the first part and consider the second. Would I go to Yuny? Certainly, on a visit. But I think I'd come back here in the end."

"Because of the place or the people?"

"The people. Earth counts less to me as a place than it does to most of the others. But you know something of our life here. Does anything like it exist anywhere else?"

"No," I admitted. "You wouldn't consider going away, and staying away, because of Tian?"

"I have—often."

"Will you consider it again?"

"Yes."

We were interrupted then. But that, short as it was, was the most satisfactory conversation I'd ever had with Jan.

IV

WHAT can I say about Refuge? Think of ancient Babylon, Rome, Athens, Paris, London, New York. Think of Neris on Yuny, Phalan on Colahima, Mercosant on Smithson, Sanctuary on Carone. Think of a city which everyone would have to agree was a little better, a little more beautiful, a little greater than any of these—and that's Refuge. Don't try to imagine it *much* better, *much* more beautiful. The imagination balks at that.

It wasn't a huge city, yet it was clearly built for many more than the seven thousand Terrans.

"When we come here," explained Wili, "we'll multiply again.

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Perhaps Earth will one day have a city of a million people once more."

"Why not come here now?" I asked, looking around me in wonder.

"Why should we? This is Refuge, when we need it. You see it's also in a valley, like Lenn. Presently, we'll show you the difference."

I could guess the difference. Lenn was a simple little town. Refuge was not only a great city, it was a powerful, versatile, clever city. The magnificent buildings were a blend of art and science. The art of the Terrans I had already seen—not till I saw Refuge did I see their science.

The exploration ship hadn't reported this. The exploration ship hadn't known about this. When one saw it, the Terrans became at once not idyllic primitives, but a still-great people. At a glance, I knew that the Terrans would be able to control the weather in this valley, heat the houses and the streets and the very air if necessary, carve out from the atmosphere above exactly the conditions they wanted. I knew they could put a dome over the city whenever they liked, and live in comfort, independent of the Sun and the conditions elsewhere on Earth. I knew that I was looking at a self-contained, almost immortal city.

"Only a few people live here at the moment," said Wili. "Perhaps a score. They are merely caretakers — everything is complete, ready for us, when we are ready to come."

So far, I was only looking around. That was enough for me, without considering the implications of what I saw. Tylo wasn't saying anything. She just stared.

We walked through the empty streets. Usually, there's something grim about an empty city, but that's because there's something grim behind the city being empty. Refuge was warm and friendly, like a new coat ready to be worn. It didn't seem dead at all—doors opened at a touch, everything was spotless, everything worked when Wili showed us things. It was a production without a single flaw.

I saw now why the Terrans were dressed as they were. Their clothes were just right for a city like this. It would never be too cold or too hot here. It would never rain or snow unless the Terrans wanted it to rain or snow. Clothes, yes, it wasn't the kind of city in which people would wander about naked. But clothes needed to supply no protection against the elements there. They would never be blown about capriciously by unwanted

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winds. They would never be caught in crude machinery or on hard, sharp corners.

Perhaps I was the wrong man to have been assigned this job. Thousands of captains would have seen only buildings in Refuge. But I saw more. I had enough appreciation of the beauty and magnificence of Refuge to overwhelm me and tell me one thing plainly.

I was going to fail. My orders were uncompromising—evacuate the Terrans. Not for their own sake, not really because Earth couldn't support them, but so that, for everyone in the Federation, a neat line could be drawn after the story of Earth, and people would cease to be concerned and sentimental about it.

I was no politician. I was simply supposed to do as I was told, without weighing the pros and cons of what was really a political and economic situation. I wasn't even a psychologist. It wasn't for me to say, "The Terrans are perfectly safe. They can look after themselves, so I left them. And anyway, I think you're wrong—it doesn't do any harm for people to be sentimental about Earth."

I went on automatically asking Wili questions, filling in the gaps.

"We haven't been building it for very long," Wili told us. "Only about fifteen years or so. And as you see, it was planned and built as a unit. There have been no afterthoughts. At the same time, the original plan allowed for any expansion which may be necessary later."

TYLO was looking at me reproachfully. I was monopolizing Wili, when I could be putting my questions to any of the Terrans. Tylo had got over her wonder. She still gave little delighted exclamations now and then, but she had already accepted the fact of the city.

I dropped back beside Jan.

"Well?" she said quizzically. I knew the extent of her question. She was thinking of our conversation in the tube, of Wili and Tylo, of herself and me, of my orders to evacuate the Terrans. I went to what seemed the root of the matter.

"This won't make the slightest difference to the Federation," I said thoughtfully. "It does to me, but then I'm not the Federation, or the Navy for that matter. What's a city to the Federation? There must be hundreds of thousands of cities in the ninety-odd worlds. The Federation wants you people away from here. It's a move in a big game, a game that has nothing to do with me."

Jan looked mildly interested, for once. "It might be fun to watch a big game like that closer

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at hand," she said. "But surely, your job ends with going back and reporting that we won't leave, that we can look after ourselves?"

I shook my head. "Not in the least. This won't make the Federation change its mind. Rather the reverse, I guess. For, if people heard about Refuge, they'd all want to see it. And, instead of Earth being written off, there would be a constant stream of tourists coming back here. A lot of people would even want to live here."

Jan nodded. "That's why Wili didn't want you to know about Refuge, if it could be avoided. He knew it wasn't likely that it could, but there was no harm in trying. We don't want your people here, Tony. They wouldn't fit in this world among us. I don't mean people like you and Tylo—people like you will come back and we'll welcome them. But the others—have the other five in your crew ever remotely understood us?"

I knew they hadn't. "But that's a minor thing," I said. "Suppose I did go back and report as you suggest. If the Federation doesn't change its mind—and it won't—it'll merely send out someone else to do my job. My going back won't solve anything. You've got to leave, Jan."

She merely smiled.

I had known all along about this other, more pleasant, more interested Jan. I couldn't have loved her if I hadn't. But this was the first time she had come into the open, and I didn't know what I wanted to do more—evacuate Earth, Jan with the rest, or try to make headway with Jan and forget the business of evacuation. There comes a time when one's private life is more important than one's public duty, and I had almost reached that stage over Jan.

We had dropped well behind the others. Wili must have noticed it, but didn't appear to mind. Jan took a turning that led us away from the group ahead. I didn't comment.

Presently Jan motioned me up shallow stone steps to a door. "I'm going to live here," she said. "We've even settled where we're going to live, you see." We went inside.

"And aren't you impatient to come and live here?"

She smiled with a touch of the old bitterness. "Me, impatient for anything?"

When she put it that way, it did sound ridiculous. I couldn't imagine Jan being excited, anticipating the pleasure of the future. She had decided that there was probably no future and certainly no pleasure in it.

"No, but the others?" I said.

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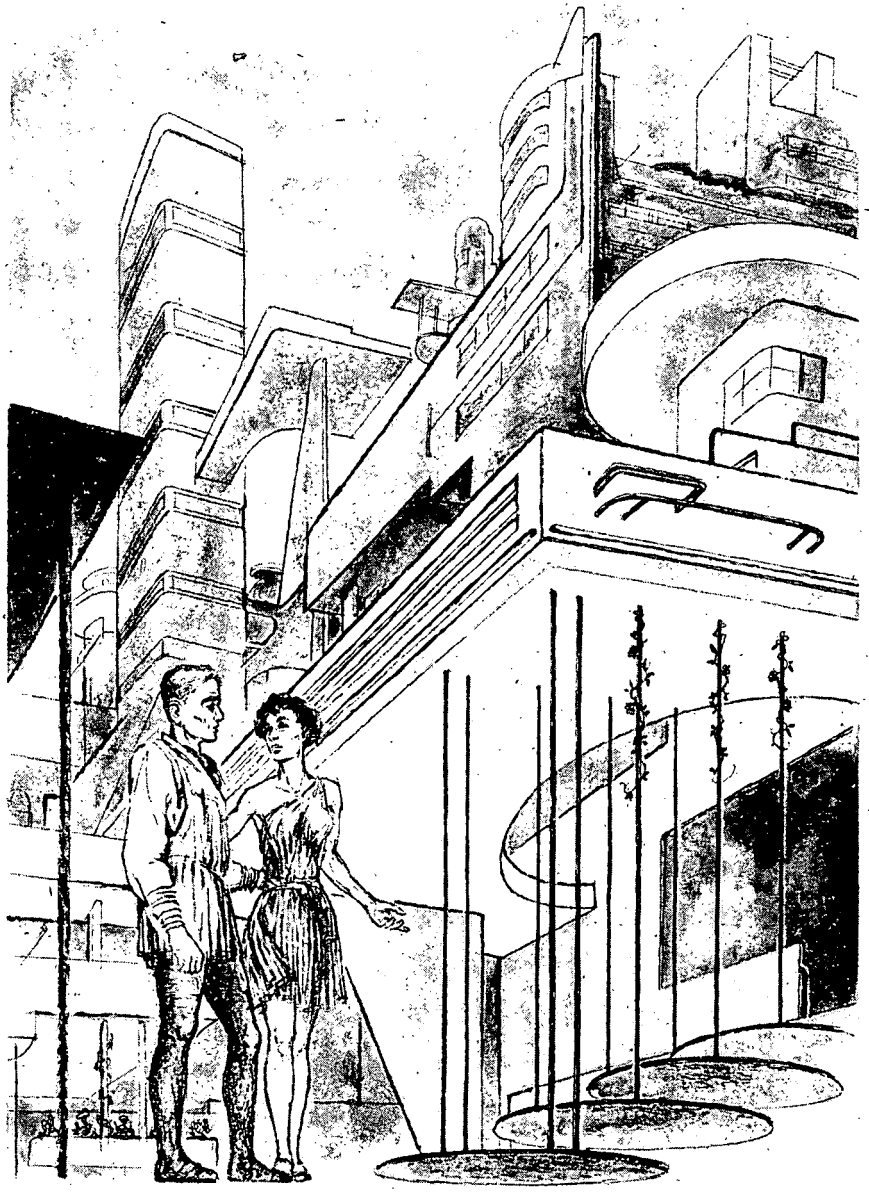

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"We're not impatient people. Besides, there's a reluctance to go in before it rains, so to speak. We have such a short time to live on Earth as people have lived since before history began —and Refuge will last forever. You see?"

She broke off her explanation, because by this time we were in what looked like a lounge. It was comfortable, but not ridiculously luxurious. The Terrans held no brief for discomfort, but there were a lot of things they rated higher. The chairs, for example, were as beautiful as possible, not as comfortable as possible. They weren't bulbous and cushiony as the most luxurious armchairs are.

JAN pirouetted in the center of the room. She was so nearly happy, and we were getting on so well together, that I knew something was due to go wrong any moment. When and if Jan gave up the Tian myth, the ghost of her love for Tian, I would know. She hadn't done it yet.

"What are you going to do?" she asked.

An idea of what I must do was forming in my mind. But I couldn't tell Jan. "Forget it," I said. "We've said all we can say on that subject."

She nodded. An odd expression came into her eyes. It wasn't resentment, it wasn't bitterness, it wasn't her occasional wry humor. It looked almost like longing. I mistrusted it.

I did mistrust Jan. I wanted her, not as she was, but as she could be.

"I like you, Tony," she said unexpectedly. "Do you really think it would be wrong if we . . . ?"

I weakened. Feeling as I did about Jan, I could turn down an offer like that only once.

"No," I said, my voice coming from far away again. "I don't really think it would be wrong."

We kissed and clung to each other. Jan bent up one leg behind her in that curious, delighted way woman have. It was completely different from the last time. It was wonderful and everything I felt was new to me, for I had never held in my arms a woman I loved a quarter as much as I loved Jan.

That made it different from anything that had ever happened to me before, and I knew it wasn't wrong, after all. I kissed Jan's forehead tenderly.

Then suddenly she burst into bitter tears and beat my chest with her fists. "You're not Tian! You're not Tian!" she cried over and over again. But she recovered herself before I had to slap her.

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TYLO wanted to stay with Meni and Tian when we got back. I indicated silently but clearly that I wanted her back at the ship with me. Jim and Mary met us as we went to my cabin, asking what we'd seen and staring wide-eyed at Tylo, but I left them with their mouths open and shut the door of the cabin behind us.

"What's the matter?" asked Tylo, puzzled.

I looked at her as if I had never seen her before. I was in a foul mood. I stared her up and down and, under my gaze, she went as red as a tomato. She hadn't been able to change completely in a few hours—the stares of Jim, Mary and me reminded her forcefully that no decent girl would wear a dress like that in public.

"Take that filthy thing off and put on your uniform," I said. "Then come back here."

I had succeeded magnificently in making her miserable and ashamed, but she stood still.

"Do as I tell you," I shouted.

"I promised Wili," she said in a small voice.

"Oh—never mind. The Terrans themselves have shown us how to evacuate them," I said. "Now we merely have to find Refuge, destroy it, and they'll—"

"*No!*" exclaimed Tylo, her face ashen. "You can't do that."

"Why not?" I said fiercely. "Our job is to carry out orders, and the Navy will blink at any little irregularity we may commit in doing so."

"It's not any *little* irregularity to destroy Refuge!" Tylo cried, grasping my arm tightly. "It's a crime!"

"With Refuge gone," I said savagely, "they'll have to come with us. That's the only thing that's enabled them to refuse. They can't build it again—we could make sure they hadn't so much as a screwdriver to start making another atom plant. It's what we're here to do."

"You're mad," said Tylo. "You don't mean it. You understand the Terrans better than I do. You understand better than I do what a magnificent thing Refuge is."

"All right," I said more calmly. "So they can build another. We'll give them a planet—a new, young world with a warm sun. They can make a better Refuge, and they won't need a dome to imprison themselves when their world dies. What's so wonderful about old, dead Earth? I tell you, Refuge is going to be blasted to dust, and the Navy won't strip me, it'll congratulate me."

SHE said, "You can't kill the people who are living there, you fool!"

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"No, I'll have to get them out first, then smash the city. They won't have weapons. Even if they have, we—"

"You can't do it, Tony," said Tylo. The first wild horror was gone. She spoke passionately, but seriously. "If you harmed Refuge, you'd never be able to forget it. I'm talking about *you,* not the Federation or the Navy or the Terrans."

Once again she had found the right thing to say without really working it out. I calmed down some more.

"I've got no choice, Tylo," I said. "Suppose I went back and reported, the first thing they'd say would be, 'You didn't have any chance to sabotage this so-called Refuge and take the fools away, did you?' And I can't see myself telling them, 'Yes, I could have done that, but it was such a pretty little city I hadn't the heart to do it.'"

"Refuge isn't a pretty little city. I'm going to live there with Wili when we can't live in Lenn any longer."

For a moment I almost let that influence me. "Has he asked you?" I demanded.

"No, but he will. I know he'll ask me."

"You'll be much more use to Wili on a young planet," I said.

Tylo snatched the door open and was gone. She moved so quickly that, though I'd been watching her closely, ready for anything she might do, she was in the passage before I could move. The door, slammed hard, hit me as I went after her. By the time I got to the airlock, she was almost in the streets of Lenn and still running faster than I could.

I closed the airlock. That meant I had to act right away. I bumped into Mary and Jim again and got them busy. The node was in the air in two minutes.

If there were any defenses, Wili would have time to get them in operation, for I didn't know exactly where Refuge was. However, I had carefully noted the position of the Sun at Lenn and at Refuge, and had a good idea where to go. With luck, Wili would warn the twenty people in Refuge to get clear.

ANYWAY, I knew I could safely destroy the main power plant of the city. It wasn't in operation and nobody lived in that district. The twenty caretakers were gathered in one corner of Refuge and, if I was careful, I could raze section after section until they made for cover. When I was sure they were clear, I could finish the job.

Jim and Mary and Ramon kept bothering me with ques-

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tions, but I only told them we had to destroy an empty town. Otherwise, I ignored them.

Over and over again I checked my orders mentally and my reading of the situation. The Federation, I was certain, wanted Earth evacuated at any price—and now. Once Refuge was destroyed, and the Terrans were away, arguments would be a waste of time. That didn't mean there wouldn't be any—nevertheless, the Navy lawyers could always make a good case to defend a captain after he had done what the Navy wanted done. No, I didn't have to worry on that score. Provided nobody was hurt, the Federation would merely listen politely to any protests the Terrans might make, then generously give them a newly charted world in full reparation.

I found Refuge even more easily than I had thought I would. From the air, in the fading light, it was a place of fairy beauty. Jim and the others exclaimed when they saw it. But they had seen the expression on my face. There was no argument.

There was no apparent defense. We had our screens up as a matter of course, but nothing was testing them. We came down closer, and I picked out a little group of people on the hillside north of the city. They had been warned, apparently. Everything was perfect. There was no fear of blast harming them, not with the precision weapons we were going to use.

I set the ranger on the site of the power-plant. It would remain on the plant now, no matter what the ship did. I set a trial limit of

17,000 yards, which might possibly destroy the plant right away, but not probably. I put my finger on the button.

V

THEN I realized I'd been play-acting, just like Jan. I knew I should press the button—I wasn't in any doubt about that.

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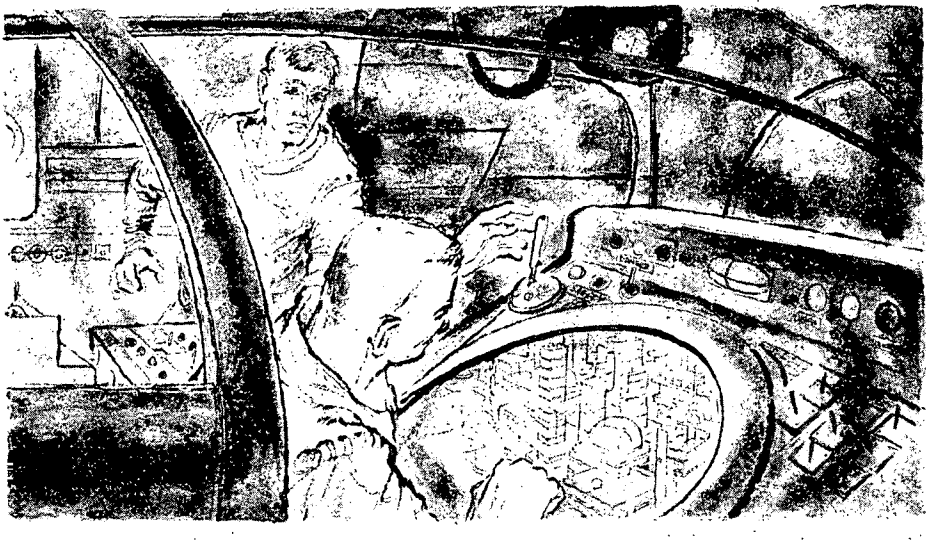
But I had never intended to do it. All I had said to Tylo was true. Nevertheless, if the Navy wanted Refuge destroyed, they would have to send someone else to do it. I couldn't.

Perhaps, at one time, I had thought my anger and bitterness



at Jan might carry me through. Certainly, if I could have given the order for someone else to destroy the city, I might have done it. But as it was, I had only been barking without any bite. I had made Tylo, who knew me better than anyone, think I was going to do it. I had almost made myself think I was going to do it.

"Cancel those last remarks," I said. "We're going back."

The others didn't understand, of course, but their faces showed relief.

I wasn't any more companionable on the way back than I had been on the way to Refuge. I knew now I had failed. Obviously, no further appeal to Wili would have any effect, and I didn't think there was any point in threatening Refuge without intending to implement the threats.

I set the ship down exactly where it had been before, as if I had merely been making a test flight. When the other noises stopped, I heard the ranger

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clicking. It was still set on the power-plant at Refuge.

I looked over at Lenn, expecting someone to come out. No one did for a while. For a moment I felt a little resentful, thinking they might come out and say they were glad I hadn't destroyed Refuge after all. Then I grinned involuntarily at the idea of the Terrans weeping tears of gratitude, because I hadn't committed what even Tylo had called a crime.

At last someone did appear, but it wasn't Tylo. It was Jan, alone.

I didn't want my crew to hear what was said, so I went out and met her outside.

For a full minute, we stood facing each other, not saying anything. I couldn't read Jan's expression, which was unusual. As a rule, it was all too clear what she was thinking.

"That was a silly thing to do, wasn't it?" she said at last.

I shrugged. "I should have gone through with it," I said. "Someone else will, later, unless you can get to work on the Federation or public opinion first."

She shook her head definitely. "You were never going to do it," she said. "I knew that when Tylo told us what had happened."

"You know me better than Tylo?"

"Perhaps. You made a scene because of what happened at Refuge, that's all. You hurt Tylo because she was happy, and you weren't. I know. I've done the same sort of thing myself."

WE smiled at each other. Jan's smile was a little bitter, but I was used to that.

"All right," said Jan. "We'll try it."

I knew what she meant. "Despite the fact that I'm not Tian?" I asked wryly. I had to take it calmly, for if I'd let myself go I'd have done something crazy.

"I don't think I could pull that one again. It crept up on me. It was as much a surprise to me as it was to you. Anyway, Tony, I keep my word. If I go through those marriage vows with you, I'll mean them."

We didn't even kiss. It seemed we'd always done that in the wrong circumstances, at the wrong time.

"Wili wants to see you," said Jan.

"I thought he might."

"You won't like what he has to say," Jan warned. "Maybe it'll damage your self-esteem. That's why I told you this first."

She'd always been like that, really. She'd never been spoiled at the core—only around the edges.

"I'll wait here," she said.

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Tylo was with Wili, but she left us alone when I appeared. She wouldn't meet my eye. I didn't know whether she was still angry with me or not, but I didn't think it was likely. Tylo couldn't let the Sun go down on her wrath if she tried.

Wili smiled and held out his hand. I took it. That made things a lot easier.

"I gather from something Jan said," I remarked, "that Refuge isn't as easy to destroy as it looks?"

"That is so. I don't think anyone will ever actually attack Refuge. We aren't going to represent competition or a threat to anyone. But all the same, we're prepared to defend it. Our weather-control, before we have to close the dome, will naturally work on a system of force-fields, enclosing masses of air and diverting rain and snow. For ordinary defense, we only have to reinforce this system. As you can imagine, power's practically limitless. We don't need Solar energy. Atomic power is enough."

I nodded, noting he hadn't told me much. That was reasonable. I'd have to report to Naval HQ., and he would naturally tell me only what he wanted to be in my report.

"That wasn't what I wanted to speak to you about, Tony," said

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Wili. He was mild and friendly, as ever. I was realizing now that Wili must have been careful all along to show me only one side of himself. Tylo couldn't have fallen in love with the bland, imperturbable, featureless character I knew. "You know Tylo is staying?"

I nodded.

"What will the Navy do about that?"

"Nothing much. It would be different if it were a man, but the women officers often desert like that. If it were made a serious offense, girls wouldn't volunteer. Besides, what happens largely depends on the captain's report, and Tylo doesn't have to worry about that."

Wili laughed. "The more I hear of this Navy of yours, the more I respect it. How do *you* feel about Tylo staying?"

"I'm not sure. Do you really love her? Are you going to make her happy?"

"Those are two very different questions. Do I really love her? No, probably. I don't think I'm made for love as you understand it. I love everybody, not individuals. But as to whether I'm going to make her happy, I think I can assure you that I will. You know her—do you doubt that?"

No, I didn't doubt that. I'd have thought Wili was a big beautiful hollow husk if it hadn't been for his mighty intelligence. That made me think it more likely that I simply didn't understand him.

"One other thing," said Wili. "You're going back now, aren't you?"

That was what I meant. As soon as you decided a thing, he knew what you'd decided and took it for granted.

"Yes," I said, "I'm going back."

"I could let you go without saying anything," Wili said thoughtfully, "but I think, since we're going to be brothers, I should tell you how to make your report. If you make it clear you know why you were sent here, and what you were meant to do, it may make an enormous difference to your career."

I was lost, completely. Wili sailed on serenely. "You believed all that rubbish you told Tylo about what the Federation really wants, didn't you?"

"It happens to be true," I said.

"Now look, Tony," said Wili quietly. "Tylo hasn't told me your orders, but I can guess what they are. You're ordered to evacuate us, but not told how, and the reason given is the sentimental importance of Earth among the Federation peoples, isn't it?"

SO this was the thing I wasn't supposed even to hint to the Terrans. I could only nod.

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"Do you think the exploration crew that was here two years ago was really deceived into thinking we couldn't look after ourselves?"

"I don't know. Perhaps not."

"Pardon my being absolutely frank. The Federation must have known we would refuse to go. The question then became a political issue. A matter for discussion and arbitration, if anything was to be done, if they really wanted us to go. They knew we were by no means fools. Did they send a political mission with the power to treat with us and offer inducements? Did they send an experienced Naval force to capture and evacuate us against our will? They did not. They took neither the peaceful nor the warlike method of gaining their alleged end.

"They sent—pardon me again—a newly promoted captain with impossible orders and a rather stupid crew. I think they underestimated you, Tony. You came a lot nearer evacuating us than anyone could have expected. You might even, for all the Navy has done to the contrary, have pulled it off."

"You mean," I exclaimed, "that I was never meant to do it?"

He was patient. "Could you have been meant to succeed?"

"But why *send* me?"

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"I can't be sure," said Wili, with startling modesty, "but there are two possibilities. Either this was somehow forced on the Federation, possibly for the reasons stated in your orders, or you've been caught up in some maneuver which has Earth as its focal point. The first is quite possible. Your orders are then perfectly sound and honest, except that the Federation knew you would fail, and hoped then to have some other plan for dealing with the situation.

"The second is a little less likely, I think. However, if this is the case, on your return, you'll probably be ridiculed and thrown out of the Navy, perhaps with full pension as recompense. Still, that can be avoided if you make it very clear in your report that you know precisely what the Federation was up to."

I was rather dazed when I left Wili. Dimly, I saw one or two things that made sense.

WITH conditions as they were, the Federation had clearly had to send a transport ship to evacuate Earth. Whether the Federation actually wanted Earth evacuated, however, was another matter. Now that I came to think of it — even Council members had that soft spot for Earth, that glad feeling that someone was still there, that Earth wasn't completely and utterly extinct.

Certainly, on my record, I wasn't any miracle-worker. Jan was right, it did damage my self-esteem a little to be told that I'd been sent out to fail. But then, I hadn't entirely failed—not really.

Jan was waiting, as she had promised. The nights on Earth were not only very dark now, they were colder, and it was almost night now. I threw my tunic around her shoulders.

"Will you come to Yuny, Jan?" I asked.

"Yes," she said and, from the sound of her voice as she went on, I knew she was smiling her wry smile. "It will be interesting to see what life is like, trillions of miles from Tian, married to someone else." More confidently she went on, "I think I can beat it, Tony. Just be patient. It does seem that there's more to life than there used to be—before you came here."

"And then," I said, "after we've seen and done a few things, and I've resigned from the Navy, perhaps we'll come back here."

She liked that. I could tell by the way she gripped my arm.

"Perhaps," I said quietly, "Earth had to get rid of all the restless spirits, the people in a hurry, before life here could be quite perfect."

—J. T. M'INTOSH

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